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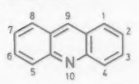

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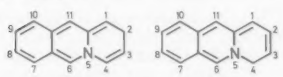

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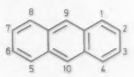

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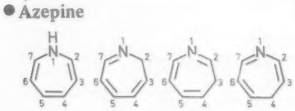

1*H*- 2*H*- 3*H*- 4*H*-

- **Hexahydroazepinium Salts**
- from Like Ring Skeletons 849
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- **Azetinium Salts**
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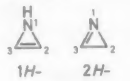

1*H*- 2*H*-

- **Aziridines**
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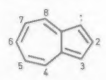

- **1,2,3,4,5,6,7,8-Octahydroazulenes**
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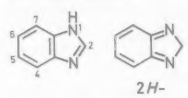

2*H*-

- **Benzimidazoles**
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- **2,3-Dihydrobenzimidazoles**
- Reactions with Retention of the Ring Skeleton 804
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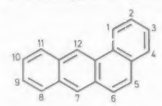
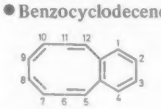
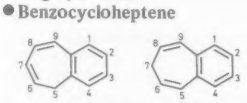


- Reactions with Retention of the Ring Skeleton 267
● **Benzocyclodecene**

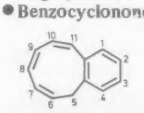


- **5,6,7,8,9,10,11,12-Octahydrobenzocyclodecenes**
- Ring Synthesis 48
● **Benzocycloheptene**



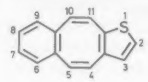
5*H*- 7*H*-

- **1,2,3,4,8,9-Hexahydro-5*H*-benzocycloheptenes**
- Ring Synthesis 349 (4922)
- **1,2,4a,6,7,8-Hexahydro-5*H*-benzocycloheptenes**
- Ring Synthesis 160
● **Benzocyclononene**

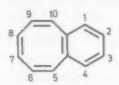


5*H*-

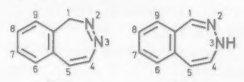
- **6,7,8,9,10,11-Hexahydro-5*H*-benzocyclononenes**
- Ring Synthesis 48
● **Benzo[5,6]cycloocta[1,2-*b*]thiophene**



- Ring Synthesis 128
● **Benzocyclooctene**

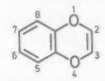


- Ring Synthesis 228
● **2,3-Benzodiazepine**



1*H*- 3*H*-

- **4,5-Dihydro-3*H*-2,3-benzodiazepines**
- Ring Synthesis 9
● **1,4-Benzodioxin**



- from Like Ring Skeleton 755
● **1,3-Benzodioxole**

- from Like Ring Skeletons 622
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● **1,3-Benzodithiole**

- **1,3-Benzodithioles**
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- Ring Synthesis 770
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- from Like Ring Skeletons 770
- Ring Synthesis 263
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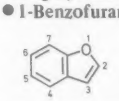

- from Like Ring Skeletons 313
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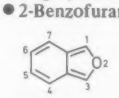
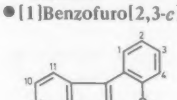
● **2-Benzofuran**

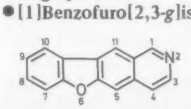


- **Phthalans**
- Ring Synthesis 225
- Reactions with Retention of the Ring Skeleton 220
● **[1]Benzofuro[2,3-*c*][1]benzopyran**

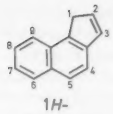


6*H*-

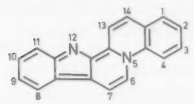
- Ring Synthesis 609
● **[1]Benzofuro[2,3-*g*]isoquinoline**



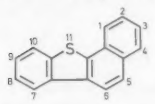
- Ring Synthesis 439
● **Benzo[*e*]indene**



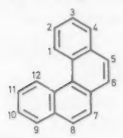
- 2,3-Dihydro-1*H*-benzo[*e*]indenes
- Ring Synthesis 702
- **Benzo[*f*]indolo[2,3-*a*]quinolizine**



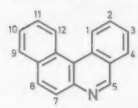
- 1,2,3,4-Tetrahydro-12*H*-5$^{\oplus}$-benzo[*f*]isoquinolizinium Salts
- Ring Synthesis 546
- **Benzo[*b*]naphtho[2,1-*d*]thiophene**



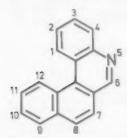
- Ring Synthesis 59
- **Benzo[*c*]phenanthrene**



- Benzo[*c*]phenanthrenes
- from Like Ring Skeletons 678
- 5,6-Dihydrobenzo[*c*]phenanthrenes
- Ring Synthesis 678
- **Benzo[*a*]phenanthridine**



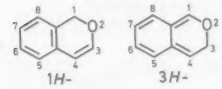
- 1,2,3,4-Tetrahydrobenzo[*a*]phenanthridines
- Ring Synthesis 724
- **Benzo[*k*]phenanthridine**



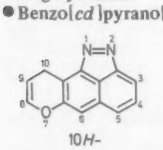
- 6,7-Dihydrobenzo[*k*]phenanthridines
- from Like Ring Skeletons 768
- 5,6,6a,7,8,12b-Hexahydrobenzo[*k*]phenanthridines
- Ring Synthesis 768
- **1-Benzopyran**

see: Chromene

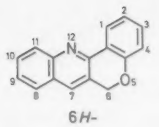
- **2-Benzopyran**



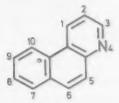
- Isochromans
- Ring Synthesis 221
- **Benzo[*cd*]pyrano[2,3-*g*]indazole**



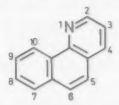
- 1,3,4,5-Tetrahydro-10*H*-benzo[*cd*]pyrano[2,3-*g*]indazoles
- Ring Synthesis 276
- **[1]Benzopyrano[4,3-*b*]quinoline**



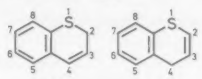
- Ring Synthesis 611
- **Benzo[*f*]quinoline**



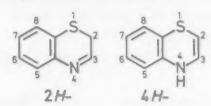
- Ring Synthesis 723
- **Benzo[*h*]quinoline**



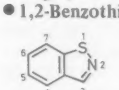
- Benzo[*h*]quinolines
- Ring Synthesis 723
- 1,4,7,8,9,10-Hexahydrobenzo[*h*]quinolines
- Ring Synthesis 277
- **1-Benzothiapyran**



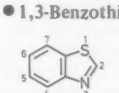
- 1-Benzothiapyrylium Salts
- Reactions with Retention of the Ring Skeleton 863
- Thiachromans
- Ring Synthesis 599
- **1,4-Benzothiazine**



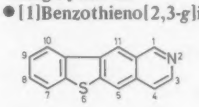
- Ring Synthesis 876
- **1,2-Benzothiazole**



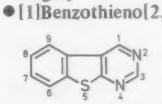
- Saccharins
- Reactions with Retention of the Ring Skeleton 619
- **1,3-Benzothiazole**



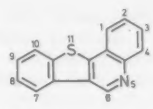
- 1,3-Benzothiazoles
- Ring Synthesis 864, 892
- 2,3-Dihydro-1,3-benzothiazoles
- Ring Synthesis 876
- Ring Transformation 876
- Octahydro-1,3-benzothiazoles
- Ring Synthesis 322
- **[1]Benzothieno[2,3-*g*]isoquinoline**



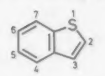
- Ring Synthesis 439
- **[1]Benzothieno[2,3-*d*]pyrimidine**



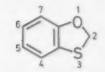
- 1,3,6,7,8,9-Hexahydro[1]benzothieno[2,3-*d*]pyrimidines
- Ring Synthesis 309
- **[1]Benzothieno[3,2-*c*]quinoline**



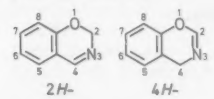
- Ring Synthesis 65
- **1-Benzothiophene**



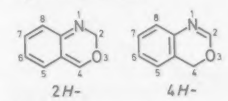
- from Like Ring Skeletons 33
- **1,3-Benzoxathiole**



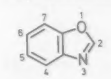
- from Like Ring Skeletons 622
- **1,3-Benzoxazine**



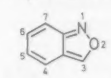
- 3,4-Dihydro-2*H*-1,3-benzoxazines
- Ring Synthesis 767
- **3,1-Benzoxazine**



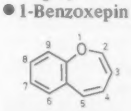
- 4*H*-3,1-Benzoxazines
- Ring Synthesis 90
- 1,2-Dihydro-4*H*-3,1-benzoxazines
- Ring Transformation 310, 500
- **1,3-Benzoxazole**



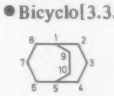
- Ring Synthesis 89, 864
- **2,1-Benzoxazole**



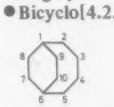
- 4,5,6,7-Tetrahydro-2,1-benzoxazoles
- Ring Synthesis 539
- **1-Benzoxepin**



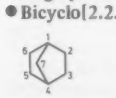
- 2,3,4,5-Tetrahydro-1-benzoxepins
- Ring Synthesis 62
- **Bi- and Polycycloalkanecarboxylic Acids**
- Synthesis 295, 675
- **Bicycloalkanes, General**
- Reactions with Retention of the Ring Skeleton 632
- **Bicyclo[3.3.2]decane**



- Ring Synthesis 675
- **Bicyclo[4.2.2]decane**



- Bicyclo[4.2.2]deca-7,9-dienes
- Ring Synthesis 633
- **Bicyclo[2.2.1]heptane**



- Bicyclo[2.2.1]heptanes
- Ring Synthesis 164
- Bicyclo[2.2.1]heptenes
- Ring Synthesis 289
● Bicyclo[3.2.0]heptane

- Bicyclo[3.2.0]heptanes
- Ring Synthesis 156
- Bicyclo[3.2.0]hept-2-enes
- Ring Cleavage 162, 163
- Ring Transformation 161
- Bicyclo[3.2.0]hept-6-enes
- Ring Synthesis 157
- Bicyclo[3.2.0]hepta-2,6-dienes
- Ring Synthesis 157
- Bicyclo[3.2.0]hepta-2,4,7-trienes
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● Bicyclo[4.1.0]heptane

- Ring Synthesis 435 (4954), 682, 700, 783
- Ring Cleavage 812 (5049)
● Bicyclo[3.1.0]hexane

- Bicyclo[3.1.0]hexanes
- Ring Synthesis 435 (4954)
- Bicyclo[3.1.0]hex-2-enes
- Ring Synthesis 165
● Bicyclo[3.2.2]nonane

- Ring Synthesis 675, 783
- Ring Transformation 675
● Bicyclo[3.3.1]nonane

- Ring Transformation 675
● Bicyclo[6.1.0]nonane

- Bicyclo[6.1.0]nona-3,5-dienes
- from Like Ring Skeletons 279
● Bicyclo[2.2.2]octane

- Ring Synthesis 290
- Ring Transformation 675
● Bicyclo[5.1.0]octane

- Ring Synthesis 700
- Ring Cleavage 812 (5049)
● Bile Pigments and Relatives
- Synthesis 614
● Biphenylene

- Ring Transformation 228
● Biphenyleno[2,3-*b*]thiophene

- Ring Synthesis 128
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- Synthesis 185, 235, 728 (5015), 897 (5066)
● Boranates
- Synthesis and Reactions 679
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- 1-Alkenylboranes
- Synthesis 139 (4853)
- Reactions 829
- Dialkylboranes Type R_2BH
- Reactions 16
- Dialkylboranes Type R_2BX
- Synthesis 696
- Reactions 141 (4861)
- Trialkylboranes
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● Boric Acid Esters
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● Bromochloro Compounds
- *gem*-Bromochlorocyclopropanes
- Synthesis 783
- Bromotrichloromethane
- Reactions 151, 809 (5041)
● *C*-Bromo Compounds
- Reactions 18, 659 (5009), 727 (5013)
- Arylbromomethanes and Hetero Analogs
- from Like Carbon Skeletons 272
- Reactions 185, 420
- Bromoalkanes
- from Like Carbon Skeletons 504 (4965), 505 (4966), 809 (5040)
- Reactions 508 (4977) (4978), 803, 809 (5040), 873, 885, 900 (5075)
- Bromoalkenes Type C=C−Br
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- Reactions 655 (4994), 667, 900 (5074), 904 (5085)
- Bromoalkenes Type C=C−C−Br
- Reactions 483, 800
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- α-Bromocarbonyl Compounds
- Synthesis 62, 503 (4960)
- α-Bromocarboxylic Acid Derivatives
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- Bromoform
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- *C*-Bromo-*N*-heterocyclic Compounds
- Synthesis 762, 866
- *C*-Bromo-*O*-heterocyclic Compounds
- Synthesis 642, 667, 734 (5031), 755
- *C*-Bromo-*S*-heterocyclic Compounds
- Reactions 547
- *C*-Bromo-*S,N*-heterocyclic Compounds
- Synthesis 320
- *gem*-Dibromoalkanes
- from Like Carbon Skeletons 65, 209 (4873)
- *vic*-Dibromoalkanes
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- Dibromoalkenes Type Br−C−C=C−C−Br
- Reactions 811 (5046)
- N−C−Br Compounds
- Reactions 794
- Tetrabromomethane
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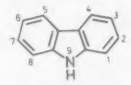
● Carbamic Acid Esters
- Synthesis 704
- Alkyl Carbamates
- Synthesis 88, 756
- 1-Haloalkyl Carbamates
- Reactions 903 (5083)
● Carbamic Acid Halides
- Reactions 777
● Carbamimidic Halides
- Reactions 345
● Carbamimidothioic Acid Esters
- Reactions 571
● Carbamohydrazonothioic Acid Esters
- Reactions 733 (5029)
● Carbazole



- 1,2,3,4-Tetrahydrocarbazoles
- Ring Synthesis 646
● Carbenes
- Dihalocarbenes
- Generation 682
- Reactions 121, 429, 682, 783
● Carbimidic Acid Esters
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● Carbodiimides
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● Carbonochloridic Acid Esters
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● Carbonyl Cyanide
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● Carboximidic Acid Esters
- Reactions 652
- 2-Alkenyl Carboximidates
- Synthesis and Reactions 68 (4839)
- Alkyl- and Aryl 2-Alkenimidates
- Synthesis 627
● Carboximidic Halides
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● Carboximidothioic Acid Esters
- Synthesis 627
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- *N*-Alkylcarboxamides
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- *N*-Arylcarboxamides
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- *N,N*-Dialkylcarboxamides
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- *N*-Unsubstituted Carboxamides
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- Reactions without Cyclization 41
● Carboxylic Acid Anhydrides
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- Cyclization Reactions 263
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- Synthesis 895
- 1-Alkoxyalkyl Esters
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- Synthesis 895
- Aryl Esters
- Reactions without Cyclization 350 (4924)
- Cyclopropyl Esters
- Synthesis 435 (4954)
- 1-Haloalkyl Esters
- Cyclization Reactions 903 (5083)
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- Synthesis 902 (5079)
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- Synthesis 434 (4949)
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- from Like Carbon Skeletons 417, 418, 658 (5002)
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Cepham

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- Reactions 18, 503 (4961), 727 (5013)
- **Arylchloromethanes**
- Reactions 803
- **Chloroalkanes**
- from Like Carbon Skeletons 505 (4966), 809 (5040)
- Reactions 809 (5040), 873, 900 (5075)
- **Chloroalkenes Type C=C–C–Cl**
- from Like Carbon Skeletons 297, 786
- Reactions 668
- **α-Chlorocarboxylic Acid Derivatives**
- from Unlike Carbon Skeletons 668
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- Synthesis 414, 768, 865
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- Synthesis 666
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- from Like Carbon Skeletons 209 (4873)
- ***vic*-Dichloroalkanes**
- from Like Carbon Skeletons 676
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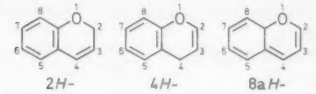
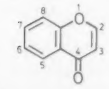
- from Unlike Carbon Skeletons 809 (5041)
- Reactions 668
- ***gem*-Dichlorocyclopropanes**
- from Unlike Carbon Skeletons 122, 429, 682
- **α-Chloro-β-dicarbonyl Compounds**
- Reactions 243
- **Polychloroarenes**
- from Unlike Carbon Skeletons 716
- **1,1,1-Trichloro Compounds**
- from Unlike Carbon Skeletons 122
● ***N*-Chloro Compounds**
- Synthesis 457
- Reactions 688
● **Chromene**

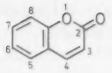


2*H*- 4*H*- 8a*H*-

- **2*H*-Chromenes**
see also: Coumarins
- Anellation Reactions 611
- **4*H*-Chromenes**
see also: Chromones, Flavones
- Ring Synthesis 871
● **Chromones**



- Ring Transformation 61, 133
● **Cobaltocenes**
- Reactions 480
● **Coumarins**



- from Like Ring Skeletons 609, 871
- Ring Synthesis 464, 560
- Reactions with Retention of the Ring Skeleton 609
● **Cyanines**
- Reactions 326
● **Cyanogen Halides**
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- **Cyclopropanecarbonitriles**
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- **α-Halonitriles**
- Synthesis and Reactions 290
- **α-Hydroxynitriles and *O*-Derivatives**
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● **Cycloalkanecarboxylic Acid Chlorides**
- Synthesis 293
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● **Cycloalkanecarboxylic Acids**
- **α-Amino-acids**
- Synthesis 191
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- Synthesis 99
● **Cycloalkanedicarboxylic Acid Esters**
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● **Cycloalkenes**
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● **Cyclobutabenzene**

- **2a,3,6,6a-Tetrahydrocyclobutabenzenes**
- Ring Transformation 279
● **Cyclobutanes**
- **Cyclobutanones and Derivatives**
- from Like Ring Skeletons 555
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- Ring Synthesis 25, 102, 163, 899 (5070)
- Ring Transformation 99
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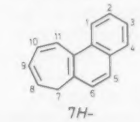
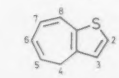
- Ring Cleavage 95, 280
● **Cyclobutenylium Salts**
- from Like Ring Skeletons 845
● **Cycloheptadienes**
- **1,3-Cycloheptadienes**
- Ring Transformation 157
- **1,4-Cycloheptadienes**
- from Like Ring Skeletons 211 (4879)
● **Cyclohepta[*a*]naphthalene**



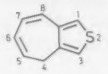
7*H*-

- **8,9,10,11-Tetrahydro-7*H*-cyclohepta[*a*]naphthalenes**
- Ring Synthesis 702
● **Cycloheptanes**
- Ring Synthesis 353 (4934)
● **Cyclohepta[*b*]thiophene**



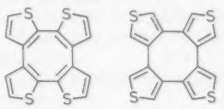
4*H*-

- **6*H*-Cyclohepta[*b*]thiophenes**
- Ring Synthesis 269
- **8*H*-Cyclohepta[*b*]thiophenes**
- from Like Ring Skeletons 269
- **Cyclohepta[*b*]thiophenium Salts**
- from Like Ring Skeletons 269
● **Cyclohepta[*c*]thiophene**



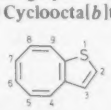
4*H*-

- **4*H*-Cyclohepta[*c*]thiophenes**
- from Like Ring Skeletons 269
- **6*H*-Cyclohepta[*c*]thiophenes**
- Ring Synthesis 269
● **Cycloheptatrienes**
- **Cycloheptatrienones (Tropones)**
- Ring Synthesis 160
- Reactions with Retention of the Ring Skeleton 204, 298
- Ring Transformation 157
- **Functionally Substituted Cycloheptatrienes**
- from Like Ring Skeletons 203
● **Cyclohexadienes**
- **1,3-Cyclohexadienes**
- from Like Ring Skeletons 215 (4891), 432, 449
- **1,4-Cyclohexadienes**
- from Like Ring Skeletons 226
- **Cyclohexadienones and Derivatives**
- from Like Ring Skeletons 229
● **Cyclohexanes**
- **Cyclohexanediones and Derivatives**
- Anellation Reactions 167, 730 (5020), 759
- Reactions with Retention of the Ring Skeleton 141 (4860), 432
- **Cyclohexanones and Derivatives**
- from Like Ring Skeletons 356 (4944)
- Ring Synthesis 26, 516
- Ring Transformation 350 (4927)
- **Functionally Substituted Cyclohexanes**
- from Like Ring Skeletons 171
- Ring Synthesis 353 (4934)
- Ring Cleavage 759
● **Cyclohexenes**
- **Cyclohexenones and Derivatives**
- from Like Ring Skeletons 229
- Ring Synthesis 294, 426
- Anellation Reactions 349 (4921) (4922)
- Reactions with Retention of the Ring Skeleton 656 (4996)
- **Functionally Substituted Cyclohexenes**
- Ring Synthesis 101, 356 (4944), 585 (4982), 886, 895
- Anellation Reactions 97
● **Cyclooctatetraenes**
- Ring Synthesis 279
● **Cyclooctatetrathiophenes**

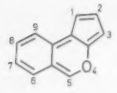


[*b,d';b'',d'''*] [*c,c';c'',c'''*]

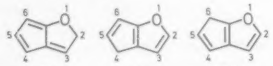
- Ring Synthesis 547
● **Cycloocta[*b*]thiophene**



- **6,7-Dihydrocycloocta[*b*]thiophenes**
- Ring Synthesis 128
● **Cyclooctenes**
- from Like Ring Skeletons 111
● **Cyclopenta[*c*][2]benzopyran**



- 1,2,3,5-Tetrahydrocyclopenta[*c*][2]benzopyrans
- Ring Synthesis 759
- **Cyclopentadienes**
- Anellation Reactions 158
- **Cyclopenta[*b*]furan**



2*H*- 4*H*- 6*H*-

- 3,3a,6,6a-Tetrahydro-2*H*-cyclopenta[*b*]furans
- Ring Synthesis 162
- **Cyclopenta[*c*]furan**

1*H*- 4*H*-

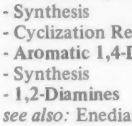
- 3,3a,6,6a-Tetrahydro-1*H*-cyclopenta[*c*]furans
- Ring Synthesis 163
- **Cyclopentanes**
- **Cyclopentanediones and Derivatives**
- from Like Ring Skeletons 282
- Anellation Reactions 730 (5020)
- **Cyclopentanones and Derivatives**
- Ring Synthesis 26
- **Functionally Substituted Cyclopentanes**
- Ring Synthesis 25, 112, 353 (4934)
- Ring Cleavage 759
- **Cyclopentenes**
- **Cyclopentenediones and Derivatives**
- Ring Synthesis 187
- **Cyclopentenones and Derivatives**
- from Like Ring Skeletons 109, 116, 592
- Annellation Reactions 46, 156, 349 (4921) (4922)
- **Functionally Substituted Cyclopentenes**
- from Like Ring Skeletons 576
- Ring Synthesis 95
- Anellation Reactions 46, 104
- **Cyclopropa[*a*]naphthalene**

1*H*-

- 1a,2,3,7b-Tetrahydro-1*H*-cyclopropa[*a*]naphthalenes
- Ring Synthesis 700
- **Cyclopropanes**
- **Cyclopropane Hydrocarbons**
- Ring Synthesis 206
- **Functionally Substituted Cyclopropanes**
- Ring Synthesis 99, 103, 122, 189, 191, 374, 429, 433 (4946), 435 (4954), 537, 682, 700, 783, 899 (5070), 903 (5083)
- Ring Cleavage 104
- Ring Transformation 349 (4921) (4922)
- **Cyclopropenes**
- Ring Synthesis 433 (4946)
- Ring Transformation 95

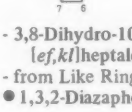
- **Decadienes**
- **1,2-Decadienes**
- from Like Ring Skeletons 483
- ***C*-Deuterio Compounds**
- Synthesis 124, 800
- **Dialdehydes**
- **Aromatic 1,4-Dicarboxaldehydes**
- Cyclization Reactions 410
- **1,5-Dialdehydes**
- Cyclization Reactions 354 (4939)
- **Heterocyclic 1,2-Dicarboxaldehydes**
- Cyclization Reactions 128, 269
- **Heterocyclic 1,4-Dicarboxaldehydes**
- from Unlike Carbon Skeletons 414
- **Diamines**
- **Aromatic 1,2-Diamines and Hetero Analogs**
- Synthesis 757
- Cyclization Reactions 864
- **Aromatic 1,4-Diamines and Hetero Analogs**
- Synthesis 762
- **1,2-Diamines**

see also: Enediamines
- Synthesis 144 (4871), 489
- **1,4-Diamines**
- Synthesis 786
- **10b,10c-Diazadicyclopenta[*ef*,*kl*]heptalene**



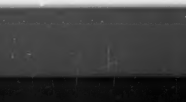
- 3,8-Dihydro-10b,10c-diazadicyclopenta[*ef*,*kl*]heptalenes
- from Like Ring Skeletons 414
- **1,3,2-Diazaphosphole**

- T etrahydro-P^V-1,3,2-diazaphospholes
- Ring Synthesis 478
- **Diazene *N*-Oxides (Azoxy Compounds)**
- Synthesis 850
- **Diazenes**
- Synthesis 339
- **1-Alkenyldiazenes**
- Synthesis 552
- Cyclization Reactions 305
- **Diaryldiazenes**
- Synthesis 850
- Reactions without Cyclization 169
- **Diazenedicarboxylic Acid Derivatives**
- Reactions 718, 886
- **Diazirine**

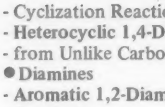


1*H*- 3*H*-

- Diaziridines
- Ring Synthesis 16
- **Diazo Compounds**
- **Diazoalkanes**
- Reactions 411
- **α-Diazoketones**
- Synthesis and Reactions 350 (4925)
- **Diazonium Betaines**
- **Aromatic Diazonium Betaines**
- Synthesis 238
- **Heterocyclic Diazonium Betaines**
- Synthesis and Reactions 556
- **Dibenzo[*a*,*h*]anthracene**

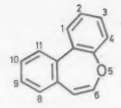


- Reactions with Retention of the Ring Skeleton 267
- **Dibenzo[*a*,*d*]cycloheptene**

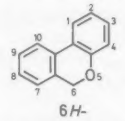


5*H*-

- from Like Ring Skeletons 175
- **Dibenzo[*b*,*d*]oxepin**



- 6,7,8,9,10,11-Hexahydrodibenzo[*b*,*d*]oxepins
- Ring Synthesis 430
- **Dibenzo[*b*,*d*]pyran**



6*H*-

- 1,2,3,4-Tetrahydro-6*H*-dibenzo[*b*,*d*]pyrans
- Ring Synthesis and Cleavage 759
- **Dibenzo[*b*,*f*][1,4]thiazepine**

- 1,2,3,4,10,11-Hexahydrodibenzo[*b*,*f*][1,4]thiazepines
- Ring Synthesis 178
- **Dicarbonic Acid Esters**
- Reactions 772
- **Dicarboxylic Acid Anhydrides and *S*-Analogs**
- Reactions 618
- **Maleic Anhydrides**
- Reactions 886, 895
- **Thiomaleic Anhydrides**
- Synthesis 559
- **Dicarboxylic Acid Imides**
- Reactions 529
- **Pentanedioic Imides (Glutarimides)**
- Synthesis and Reactions 686
- ***N*-Hydroxyimides**
- Reactions 278
- **Succinimides**
- Reactions 414
- **Dienecarboxylic Acid Esters (conjugated)**
- Synthesis 681
- **Dienecarboxylic Acid Esters (non-conjugated)**
- Synthesis 142 (4865)
- **Dienedicarboxylic Acid Esters (conjugated)**
- Synthesis 564
- **Dienedinitriles (conjugated)**
- Synthesis 566
- **Dienes (conjugated)**
- from Unlike Carbon Skeletons 139 (4854), 347 (4917)
- Reactions without Cyclization 811 (5045)
- **1,3,7-Alkatrienes**
- from Unlike Carbon Skeletons 334
- **Diene Hydrocarbons**
- from Heterocyclic Compounds 585 (4980)
- from Unlike Carbon Skeletons 665, 898 (5067)
- Cyclization Reactions 290, 585 (4982), 633, 672
- Reactions without Cyclization 144 (4871), 307, 334, 649, 658 (5004), 904 (5084)
- **Functionally Substituted Dienes**
- from Like Carbon Skeletons 551, 895
- from Unlike Carbon Skeletons 95, 109
- Cyclization Reactions 101, 886, 895
- **Diimidazo[1,2-*b*;2′,1′-*f*]pyridazine**

- Diimidazo[1,2-*b*;2′,1′-*f*]pyridazines
- from Like Ring Skeletons 762
- **1,2,7,8-Tetrahydrodiimidazo-[1,2-*b*;2′,1′-*f*]pyridazines**

- Ring Synthesis 762
● Diketones
- Reactions without Cyclization 466
- 2-Alkene-1,4-diones
- from Like Carbon Skeletons 141 (4860)
- 2-Alkylidene-1,3-diketones
- from Like Carbon Skeletons 212 (4881)
- 2-(1-Aminoalkylidene)-1,3-diketones
- from Like Carbon Skeletons 723
- Cyclization Reactions 723
- Cyclic 1,3-Diketones
- from Like Carbon Skeletons 282
- from Unlike Carbon Skeletons 62
- Cyclization Reactions 730 (5020), 759
- 1,2-Diketones
- from Like Carbon Skeletons 403, 814 (5054)
- Cyclization Reactions 714, 754
- Reactions without Cyclization 211 (4880), 564, 566
- 1,3-Diketones
- from Unlike Carbon Skeletons 98
- Cyclization Reactions 187, 309
- Reactions without Cyclization 114, 212 (4881), 455, 510, 779
- 1,4-Diketones
- from Like Carbon Skeletons 213 (4886), 814 (5055)
- from Unlike Carbon Skeletons 98, 214 (4887), 280, 288 (4912), 393, 506 (4972), 815 (5058)
- Cyclization Reactions 280
- Reactions without Cyclization 141 (4860)
- 1,5-Diketones
- from Like Carbon Skeletons 213 (4886), 424
- from Unlike Carbon Skeletons 108, 815 (5058)
- Cyclization Reactions 426
- 1,6-Diketones
- from Unlike Carbon Skeletons 389
● Diols (including *O*-Protected Derivatives)
- Cyclization Reactions 287 (4909), 353 (4934)
- Reactions without Cyclization 484, 658 (5005)
- 2-Alkyne-1,4-diols
- Synthesis 895
- Cyclization Reactions 660 (5011)
- Cyclic 1,2-Diols
- Reactions without Cyclization 280
- 1,2-Diols
- Synthesis 105, 209 (4875), 355 (4941), 449
- Cyclization Reactions 707
- 1,3-Diols
- Synthesis 261, 665
- Cyclization Reactions 261
- Reactions without Cyclization 731 (5023)
- 1,5-Diols
- Reactions without Cyclization 731 (5022)
- 1,6-Diols
- Reactions without Cyclization 731 (5022)
● 1,2,4-Dioxazole

- Ring Synthesis 573
● 1,3-Dioxin

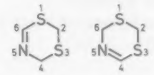
- 1,3-Dioxanes
- Ring Synthesis 90, 663, 734 (5031)
- Ring Cleavage 665, 734 (5031)
● 1,4-Dioxin

- Dihydro-1,4-dioxins
- from Like Ring Skeletons 266
● 1,3-Dioxole

- 1,3-Dioxolanes
- Ring Synthesis 101
● 1,4-Diphosphorin

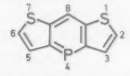
- 1,4-Dihydro-1,4-diphosphorins
- Ring Synthesis 844
● 1,3-Diselenole

- Ring Synthesis 765
● Disulfides
- Synthesis 144 (4872)
- Reactions 14, 144 (4872)
- Bis[3-oxo-1-alkenyl] Disulfides
- Synthesis 265
- Diaryl Disulfides
- Reactions 323
- *N*-Heterocyclic Disulfides
- Reactions 485
● Dithiafulvalenes
- Synthesis 861
● 1,3,5-Dithiazine



4*H*- 6*H*-

- Ring Synthesis 193, 476
● Dithieno[3,2-*b*;2′,3′-*e*]phosphorin



- 4,8-Dihydro-P^V-dithieno[3,2-*b*;2′,3′-*e*]phosphorins
- Ring Synthesis 548
● 1,4-Dithiepin

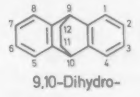
- Tetrahydro-1,4-dithiepins
- Ring Synthesis 71 (4849)
● 1,3-Dithiin

- 1,3-Dithianes
- Reactions with Retention of the Ring Skeleton 367
- Ring Transformation 71 (4849)
● Dithiocarbonic Acid Esters
- *O,S*-Diesters
- Synthesis 659 (5006), 873
- Reactions 659 (5006) (5007), 873
● Dithiocarboxylic Acid Esters
- Synthesis 734 (5032)
- Reactions 507 (4975)
● 1,2-Dithiole

- Ring Synthesis 802
● 1,3-Dithiole

- 1,3-Dithiolanes
- Ring Cleavage 224 (4899)
● Dithiols
- Arene-1,2-dithiols
- Cyclization Reactions 263, 770
- *gem*-Dithiols
- Cyclization Reactions 193
● Diynes (conjugated)
- from Unlike Carbon Skeletons 53
- Reactions without Cyclization 52

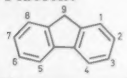
● Enamines
- Synthesis 196, 503 (4962), 729 (5018)
- Cyclization Reactions 326
- Reactions without Cyclization 495, 655 (4992), 815 (5058), 848
● Enediamines
- Cyclization Reactions 688
● Enediols and *O*-Derivatives
- Reactions 142 (4863)
● Enols (including *O*-Protected Derivatives)
- Synthesis 97
- Reactions 120
● Enynes (conjugated)
- Synthesis 52, 826
● Epoxides (Epoxy Compounds)
see also: Oxirene (Oxiranes)
- Synthesis 112, 503 (4960), 581, 838
- Reactions 35
● Ester Aminals
- Reactions 814 (5054)
● 9,10-Ethanoanthracene



9,10-Dihydro-

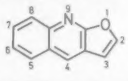
- 9,10-Dihydro-9,10-ethanoanthracenes
- Ring Synthesis 294
● Ethers
- 1,2-Alkadienyl Ethers
- Synthesis 505 (4968)
- 1-Alkenyl Ethers
- Synthesis 298, 570, 655 (4994)
- Reactions 90, 578
- 2-Alkenyl Ethers
- Synthesis 115
- Reactions 283 (4897), 435 (4953), 543, 730 (5021)
- Alkyl Aryl Ethers
- Synthesis 115, 225, 568, 803
- Reactions 417, 658 (5002)
- 2-Alkynyl Ethers
- Synthesis 568
- Reactions 543
- Crown Ethers
- Synthesis 854
- Cyclopropenyl Ethers
- Synthesis 433 (4946)
- Cyclopropyl Ethers
- Synthesis 433 (4946)
- Dialkyl Ethers
- Synthesis 659 (5009), 803
- Reactions 351 (4929), 421, 718
- 1,1-Dihaloalkyl Ethers
- Reactions 721
- 1-Haloalkyl Ethers
- Reactions 433 (4946)
- 3-Haloalkyl Ethers
- Synthesis 666
- 4-Haloalkyl Ethers
- Synthesis 659 (5009)
- Hydroquinone Ethers
- Reactions 899 (5072), 900 (5073)
- 3-Hydroxyalkyl Ethers
- Synthesis 731 (5023)
- Polyethyleneglycol Ethers
- Synthesis 854

● Fluorene



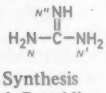
- Fluorenones and Derivatives
- Ring Synthesis 187
- 1,2,3,4,4a,9a-Hexahydrofluorenes
- from Like Ring Skeletons 577
● *C*-Fluoro-Compounds
- from Like Carbon Skeletons 284 (4899)
- Arylfluoromethanes
- from Like Carbon Skeletons 185
- Fluoroarenes
- from Like Carbon Skeletons 267, 656
- α-Fluorocarbonyl Compounds
- from Like Carbon Skeletons 189
- Polyfluoro Compounds
- Synthesis and Reactions 551
- S–C–F Compounds
- Synthesis 791
● Fulvenes
- Reactions 290
● Furan

- Furans
- from Like Ring Skeletons 313
- Ring Synthesis 109, 280, 838
- 2,2′-Bifurans
- Synthesis 897 (5066)
- 2,3-Dihydrofurans
- from Like Ring Skeletons 867
- Ring Synthesis 99, 187, 754
- Reactions with Retention of the Ring Skeleton 187
- Ring Transformation 187
- 2,5-Dihydrofurans
- Ring Synthesis 660 (5011)
- Ring Cleavage 642
- Tetrahydrofurans
- Ring Cleavage 659 (5009)
● Furo[2,3-*b*]quinoline



- 2,3-Dihydrofuro[2,3-*b*]quinolines
- Ring Synthesis and Transformation 768

● Gibberellin Precursors
- Synthesis 577
● Glycerol and Derivatives
- Reactions 484
- Monoethers
- Synthesis 423
- *O*,*O*′-Diacylglycerol Phosphates
- Synthesis 673
● Guanidines



- Synthesis 88
- 1-Guanidinoalkanephosphonic Acid Derivatives
- Synthesis 571

● *N*-Heteroarenes, General
- Reactions with Retention of the Ring Skeleton 5, 544
● Heteroaromatic *N*-Oxides
- Ring Synthesis 760
● Heterocyclic Carboxamides
- *O*-Heterocyclic Carboxamides
- Cyclization Reactions 612
- *S*-Heterocyclic Carboxamides
- Cyclization Reactions 309
● *N*-Heterocyclic Carboxylic Acid Esters
- Synthesis 326
● Heterocyclic Carboxylic Acids
- *N*-Heterocyclic Carboxylic Acids
- Synthesis 326, 497, 716
- Reactions 585 (4981), 660 (5010)
- *O*-Heterocyclic Carboxylic Acids
- Synthesis 313
● *S*-Heterocyclic Di- and Polycarboxylic Acid Derivatives
- Synthesis 200
● *N*-Heterocyclic Nitriles
- Reactions 120
● Homocubanes

- Ring Synthesis 157
● Hydrazines
- Cyclization Reactions 136
- Reactions without Cyclization 339
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- *N*-Alkyl-*N*-arylhydrazines
- Synthesis 8
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- Arylhydrazines
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- *N*,*N*-Dialkylhydrazines
- Synthesis 8
- Hydrazinecarboxylic Acid Esters
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- Hydrazine-*N*,*N*′-dicarboxylic Acid Derivatives
- Synthesis 718
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- *N*-Alkylhydroxylamine-*O*-sulfonic Acids
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- Synthesis 856
- *N*-Hydroxyimides and *O*-Derivatives
- Synthesis 278
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- Triacylhydroxylamines
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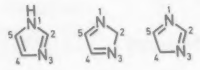
● Imidazole



2*H*- 4*H*-

- Imidazoles
- from Like Ring Skeletons 253, 688
- Ring Synthesis 459
- 2,3-Dihydroimidazoles
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- 4,5-Dihydroimidazoles
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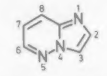
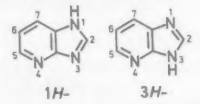
- Imidazolidines
- from Like Ring Skeletons 641
- Ring Synthesis 81, 806
- Reactions with Retention of the Ring Skeleton 641
● Imidazo[1,2-*b*]pyridazine



- Imidazo[1,2-*b*]pyridazines
- from Like Ring Skeletons 762
- 2,3-Dihydroimidazo[1,2-*b*]pyridazines
- Ring Synthesis 762
● Imidazo[4,5-*b*]pyridine



1*H*- 3*H*-

- Ring Synthesis 89
● Imines
- Cyclization Reactions 884
- Reactions without Cyclization 318, 489
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- Reactions without Cyclization 731 (5024)
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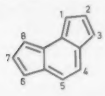
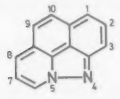
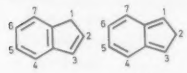
- Synthesis and Cyclization Reactions 326
- Cyclic Iminium Salts
- Synthesis 585 (4981)
● *as*-Indacene



- 1,2,3,6,7,8-Hexahydro-*as*-indacenes
- Ring Synthesis 702
● Indazolo[5,4,3,2-*hij*]quinoline

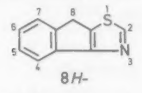


- 1,2,3,8-Tetrahydro[5,4,3,2-*hij*]quinolines
- Ring Synthesis 277
● Indene



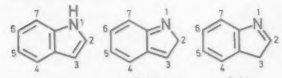
2*H*-

- 2,3,3a,4,5,6-Hexahydroindenes
- Ring Synthesis 730 (5020)
- 2,3,4,5,6,7-Hexahydroindenes
- Ring Synthesis 349 (4921)
- 2,4,5,6,7,7a-Hexahydroindenes
- Ring Synthesis 812 (5049)
- Indanes
- from Like Ring Skeletons 848
- Ring Synthesis 415
● Indeno[1,2-*d*][1,3]thiazole



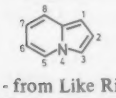
8*H*-

- 2,3,3a,8a-Tetrahydro-8*H*-indeno-[1,2-*d*][1,3]thiazoles
- Ring Synthesis 322
● Indole



2*H*- 3*H*-

- Indoles
- Ring Synthesis 645
- from Like Ring Skeletons 335
- Reactions with Retention of the Ring Skeleton 858
- 3*H*-Indoles
- Reactions with Retention of the Ring Skeleton 343
- 2,3-Dihydroindoles
- from Like Ring Skeletons 859
- Ring Synthesis 879
- 3,3a,4,5-Tetrahydro-2*H*-indoles
- from Like Ring Skeletons 879
- 3a,4,7,7a-Tetrahydro-3*H*-indoles
- from Like Ring Skeletons 652
- 2,3,3a,4,5,6-Hexahydroindoles
- from Like Ring Skeletons 879
- 2,3,3a,4,7,7a-Hexahydroindoles
- from Like Ring Skeletons 652
● Indolizine



- from Like Ring Skeletons 323
● *C*-Iodo Compounds
- from Like Carbon Skeletons 503 (4961)
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- *vic*-Acyloxyiodoalkanes
- Synthesis 902 (5079)
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- Aryldiacyliodine
- Synthesis 574
● Iodyl Compounds and Derivatives
- Aryldiacyliodine Oxides, Aryltetraacyl-iodine
- Synthesis 574
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- Synthesis 216 (4895)
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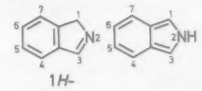
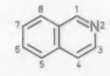
● Isocyanides
- Synthesis 275
- α-Isocyanocarboxylic Acid Derivatives
- Reactions 249
- 1-Sulfonylalkyl Isocyanides
- Cyclization Reactions 501
● Isoindole



1*H*-

- 2,3-Dihydro-1*H*-isoindoles
- Ring Synthesis 545, 660 (5012)
● Isoquinoline



- Isoquinolines
- Ring Synthesis 760
- Isoquinolinium Ylides
- Synthesis 243
- 1,2-Dihydroisoquinolines
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- 5,6,7,8-Tetrahydroisoquinolines
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- Cyclization Reactions 158
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- from Like Carbon Skeletons 140 (4857), 211 (4879)
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- from Unlike Carbon Skeletons 730 (5019), 813 (5051), 814 (5055)
- Alkyl Aryl Ketones
- from Like Carbon Skeletons 69 (4842)
- from Unlike Carbon Skeletons 586 (4983), 900 (5074)
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- Reactions without Cyclization 412, 507 (4974), 780, 814 (5054)
- 1-Alkynyl Ketones
- from Unlike Carbon Skeletons 679, 777
- Arene-Fused Cycloalkenones
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- from Unlike Carbon Skeletons 289
- Bis[1-alkenyl] Ketones
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- Cyclopropyl Ketones
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- Dialkyl Ketones
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- from Like Carbon Skeletons 13
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- β,γ-Epoxyketones
- from Like Carbon Skeletons 838
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- 4-Halo-3-alkenyl Ketones
- from Unlike Carbon Skeletons 424
- α-Haloketones
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- Heterocyclic Ketones (Oxo-*S*-heterocycles)
- Synthesis 200
- 4-Hydroxy-1-alkenyl Ketones and *O*-Derivatives
- from Unlike Carbon Skeletons 67 (4838)
- Hydroxyketones, General
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- from Like Carbon Skeletons 731 (5022)
- β-Iminoketones
- from Unlike Carbon Skeletons 780
- α-Mercaptoketones and *S*-Derivatives
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- from Unlike Carbon Skeletons 67 (4838)
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- α-Sulfonylketones
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- Synthesis 407, 660 (5010), 814 (5056)
- 4-Alkanelactams
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- 5-Alkanelactams
- Synthesis and Reactions 686
- 2-Alkene-4-lactams
- Synthesis 869
- 4-Alkene-5-lactams
- Synthesis 686
- *N*-(1-Alkenyl)-lactams
- Reactions 242

● Lactim Derivatives
- *O*-Alkyllactims
- Reactions 652

● Lactols
- Synthesis 163, 350 (4927)
- Reactions 163

● Lactones (General and Monocyclic)
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- 3-Alkanolides
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- 4-Alkanolides
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- 5-Alkanolides
- Synthesis 735 (5035)
- 6-Alkanolides
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- 2-Halo-4-alkanolides
- Synthesis 146
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- 2-Oxo-4-alkanolides
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● Malonic Acid Esters
- Cyclization Reactions 760
- Reactions 759, 779
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- from Unlike Carbon Skeletons 205
- Alkylarylmalonic Esters
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- Alkylidenemalonic Esters
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- (Dicyanohydroxymethyl)-malonic Esters
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- Dihalomalonic Esters
- Cyclization Reactions 150
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● Metal Alkoxides
- Synthesis 354 (4937)

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- Carbonylmetallates
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- Enediyl Metal Complexes
- Reactions 904 (5084)
- Metallocyclopentadienes
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- Synthesis 692

● *N*-Metal Compounds
- *N,N'*-Bis[halomagnesio]-thioureas
- Reactions 889
- *N,N'*-Dilithiothioureas
- Reactions 889
- Lithium Amides
- Reactions 580

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- Alkali-Metal Enolates
- Reactions 48, 91, 432
- Dienolates
- Reactions 142 (4865)

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- Reactions 355 (4942)
- *O*-Acylhexoses
- Reactions 774
- Aldohexoses
- Synthesis 568
- Deoxyhexoses
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- Hexitols and *O*-Derivatives
- Reactions 423
- Hexose Phosphates
- Synthesis 740
- Sugar Lactones
- Reactions 569

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- Naphthalenes
- from Like Ring Skeletons 317
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- 2,2'-Binaphthyls
- Synthesis 897 (5066)
- 1,2,3,4-Tetrahydronaphthalenes (Tetralins)
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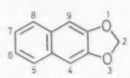
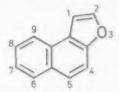
- 1,2,3,4,4a,5,6,7-Octahydronaphthalenes
- Ring Synthesis 97, 167, 290, 426, 608, 730 (5020)
- 1,2,3,4,4a,5,6,8a-Octahydronaphthalenes
- Ring Synthesis 101

● Naphtho[2,3-*d*]-1,3-dioxole



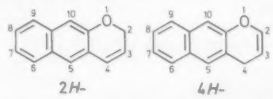
- Ring Synthesis 354 (4938)

● Naphtho[2,1-*b*]furan



- 1,2-Dihydronaphtho[2,1-*b*]furans
- from Like Ring Skeletons 714
- 2,5-Dihydronaphtho[2,1-*b*]furans
- Ring Synthesis 714

● Naphtho[2,3-*b*]pyran



2*H*- 4*H*-

- 6,7,8,9-Tetrahydro-4*H*-naphtho[2,3-*b*]-pyrans
- Ring Transformation 277

● Nitric Acid Esters
- Synthesis 218, 484, 504 (4965)

● Nitrile Oxides
- Cyclization Reactions 813 (5053)

● Nitriles, General
- from Like Carbon Skeletons 15, 42, 216 (4894), 245, 902 (5080)
- Cyclization Reactions 345, 476
- Reactions without Cyclization 35, 508 (4979), 625, 780

● Nitrilium Salts
in situ Generation and Reactions 345

● Nitro Compounds
- Diarylnitromethanes and Hetero Analogs

- Synthesis 459
- Reactions 460
- *gem*-Halonitro Compounds
- Reactions 508 (4976)
- Nitroalkanes
- Synthesis 115, 294
- Reactions 212 (4882), 733 (5027), 792
- Nitroalkenes Type C=C–NO_2
- Reactions 214 (4887), 295, 516
- Nitroalkyl Acetals
- Reactions 570
- Nitroarenes
- Synthesis 218, 315
- Reactions 118, 792, 850, 851
- α-Nitrocarboxylic Acid Derivatives
- Synthesis 115
- 3-Nitro-1,4-dienes
- Synthesis 226
- *N*-Nitro Compounds
- Synthesis 225

● Nitrones
- Synthesis 318
- Heterocyclic Nitrones
- Synthesis 56

● Nitroso Compounds
- Synthesis 850

● Nitrous Acid Esters
- Synthesis 504 (4965)

● Nitroxyls
- Synthesis 312
- Reactions 312, 618, 619

● Nucleosides
- Synthesis 453, 725
- Reactions 45, 725

● Nucleotides
- Synthesis 451, 739

● Organoaluminum Compounds
- 1-Alkenylalanes
- Reactions 142 (4864), 347 (4917)
- Dialkylalanes Type R_2AlX
- Synthesis 391
- Tetraorganoalanates
- Reactions 141 (4859), 283 (4898)
- Trialkylalanes
- Reactions 212 (4883)

● Organocopper Compounds
- 1-Alkenylcopper(I)
- Reactions 730 (5019), 828
- Arylcopper(I)
- Reactions 728 (5015)
- Organocuprates
- Reactions 213 (4885), 349 (4921) (4922), 784, 829

● Organogallium Compounds
- Synthesis 30

● Organolead Compounds
- Synthesis 30

● Organolithium Compounds
- *C*–*C* Coupling Reactions 638, 710, 827
- Miscellaneous Reactions 588 (4989)
- 1-Alkenyllithium
- Synthesis 210 (4876), 215 (4891), 904 (5085)
- *C*–*C* Coupling Reactions 210 (4876) (4877), 904 (5085)
- Alkyllithium
- *C*–*C* Coupling Reactions 317
- 1-Alkynyllithium
- *C*–*C* Coupling Reactions 206, 679
- Miscellaneous Reactions 888
- Aryllithium
- *C*–*C* Coupling Reactions 686
- Di- and Polylithio Compounds
- *C*–*C* Coupling Reactions 509
- α-Lithiocarboxylic Acid Derivatives
- *C*–*C* Coupling Reactions 245, 288 (4914), 734 (5032), 735 (5033)
- Miscellaneous Reactions 95
- *C*-Lithio-*N*-heterocyclic Compounds
- *C*–*C* Coupling Reactions 242
- *C*-Lithio-*O*-heterocyclic Compounds
- *C*–*C* Coupling Reactions 686
- N–CLi Compounds
- *C*–*C* Coupling Reactions 141 (4861), 424, 800, 869
- O-CLi Compounds
- Miscellaneous Reactions 68 (4840)
- P–CLi Compounds
- *C*–*C* Coupling Reactions 616
- S–CLi Compounds
- *C*–*C* Coupling Reactions 367, 809 (5039)
- Se–CLi Compounds
- *C*–*C* Coupling Reactions 586 (4985)
- Si–CLi Compounds
- Synthesis 352 (4933)
- *C*–*C* Coupling Reactions 352 (4933), 812 (5048)

● Organomagnesium Compounds
- General, Type R–MgHal
- *C*–*C* Coupling Reactions 85, 287 (4910), 505 (4968), 638, 655 (4994), 708, 826, 900 (5074)
- Miscellaneous Reactions 135
- 1-Alkenylmagnesium Halides
- *C*–*C* Coupling Reactions 205, 814 (5055)
- Alkylmagnesium Halides
- *C*–*C* Coupling Reactions 141 (4862), 317, 461
- Miscellaneous Reactions 287 (4908)
- 1-Alkynylmagnesium Halides
- *C*–*C* Coupling Reactions 206
- Dialkylmagnesium
- *C*–*C* Coupling Reactions 461

● Organomanganese Compounds
- Synthesis 130
- Reactions 130, 287 (4908)

● Organomercury Compounds
- 1-Alkenylmercury Halides
- Synthesis 660 (5011)
- Reactions 139 (4853), 506 (4970), 660 (5011), 989 (5067)
- Arylmercury Halides
- Reactions 776, 897 (5066)

● Organopotassium Compounds
- Reactions 509

● Organosodium Compounds
- Di- and Polysodio Compounds
- *C*–*C* Coupling Reactions 509

● Organothallium Compounds
- Synthesis and Reactions 656 (4998)

● Organotin Compounds
see: Stannanes

● Organozinc Compounds
- Synthesis 207
- Reactions 205, 568

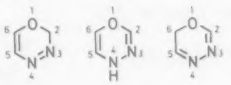
● Orthocarbamic Acid Esters
- Synthesis 79

● Orthocarbonic Acid Esters
- Synthesis 73
- Reactions 83

● Orthocarbonic Acid Triamides
- Synthesis 82

● Orthocarboxylic Acid Esters
- Synthesis 85, 507 (4975)
- Reactions 136, 593

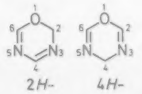
● 1,3,4-Oxadiazine



2*H*- 4*H*- 6*H*-

- Ring Synthesis and Transformation 252

● 1,3,5-Oxadiazine



2*H*- 4*H*-

- 1,3,5-Oxadiazinium Salts
- Ring Cleavage 788
- Tetrahydro-1,3,5-oxadiazines
- Reactions with Retention of the Ring Skeleton 753

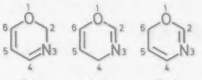
● 1,3,4-Oxadiazole

- 1,3,4-Oxadiazoles
- Ring Synthesis 481
- 2,3-Dihydro-1,3,4-oxadiazoles
- Ring Synthesis 16

● 1,3-Oxathiole

- 1,3-Oxathiolanes
- Ring Synthesis 101

● 1,3-Oxazine



2*H*- 4*H*- 6*H*-

- 3,4-Dihydro-2*H*-1,3-oxazines
- Ring Synthesis 314
- 5,6-Dihydro-4*H*-1,3-oxazines
- from Like Ring Skeletons 812 (5048)

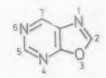
● 1,2-Oxazole

- 1,2-Oxazoles
- from Like Ring Skeletons 837
- Ring Synthesis 538
- 4,5-Dihydro-1,2-oxazoles
- Ring Synthesis 538
- Reactions with Retention of the Ring Skeleton 837

● 1,3-Oxazole

- 1,3-Oxazoles
- Ring Transformation 572
- 4,5-Dihydro-1,3-oxazoles
- Ring Synthesis 133
- Ring Cleavage 69 (4844)
- Tetrahydro-1,3-oxazoles
- Ring Synthesis 90

● [1,3]Oxazolo[5,4-*d*]pyrimidine



- 6,7-Dihydro-[1,3]oxazolo[5,4-*d*]pyrimidines
- Ring Synthesis 88

● Oxime Derivatives
- *O*-Alkyl- and *O*-Aryloximes
- Synthesis 265, 466
- Reactions 15
- *O*-Sulfonyloximes
- Synthesis and Reactions 15

● Oximes
- Cyclization Reactions 539
- Regeneration of the Carbonyl Compound 308
- Aldoximes
- Reactions without Cyclization 42, 338
- 1-Aryloximes
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- *vic*-Dioximes
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- Ketoximes
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- Reactions without Cyclization 42, 69 (4843), 539, 856
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- Synthesis 649
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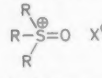
- α-Oxooximes
- Synthesis 100
● Oxirene

- Oxiranes
- Ring Synthesis 503 (4960), 694, 707, 711, 815 (5059)
- Ring Cleavage 433 (4947), 503 (4960), 543, 585 (4980), 899 (5070)
- Ring Transformation 435 (4955)
● Oxonium Salts
- Reactions 144 (4872)
● Oxosulfonium Salts



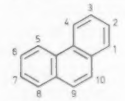
- Aminooxosulfonium Salts
- Synthesis 12

● Penams, Penicillins, and Relatives

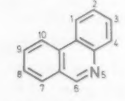
Penam

- Reactions 494
● Penicillanic Acids
- Synthesis 494
● Pentalene

- 1,2,3,4,5,6-Hexahydropentalenes
- Ring Synthesis 349 (4921)
- Pentalanes
- Ring Synthesis 104
● Peptides
- Synthesis 303
- Reactions 588 (4990)
● Peroxy Compounds
- Cyclic Peroxides
- Synthesis 573
● Phanes
- [2.2]Cyclophanes
- Synthesis 544
● Phenanthrene



- Phenanthrenes
- Ring Synthesis 261
- 1,2,3,4,5,6,7,8-Octahydrophenanthrenes
- Ring Synthesis 702
- 1,2,3,4,4a,9,10,10a-Octahydrophenanthrenes
- Ring Synthesis 261
● Phenanthridine



- 7,8,9,10-Tetrahydrophenanthridines
- Ring Synthesis 724
● Phenols
- from Like Ring Skeletons 122, 340, 350 (4924), 412, 417, 656 (4996), 658 (5002), 730 (5021)
- Anellation Reactions 123, 430, 767
- Reactions with Retention of the Ring Skeleton 53, 122, 209 (4874), 270, 704, 796, 811 (5047), 847, 899 (5071)
- *O*-Acylphenols
- Synthesis 435 (4953)
- *o*-Aminomethylphenols
- Anellation Reactions 767
- *o*-Aminophenols
- Anellation Reactions 864
- Diphenols
- from Like Ring Skeletons 141 (4860)
- Reactions 644
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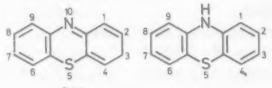
- from Like Ring Skeletons 209 (4874)
- Reactions with Retention of the Ring Skeleton 898 (5068)
- Nitrophenols
- from Like Ring Skeletons 228
- *O*-Silylphenols
- Synthesis 436 (4958)
● Phenothiazine



3*H*-

- from Like Ring Skeletons 341
● Pheromones and Relatives
- Synthesis 405, 561, 817
● 1-Phosphabicyclo[2.2.1]heptane

- Ring Synthesis 27
● 1,4-Phospharsenin

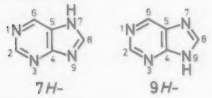
- 1,4-Dihydro-1,4-phospharsenins
- Ring Synthesis 844
● 1,4-Phosphasilicin

- 1,4-Dihydro-1,4-phosphasilicins
- Ring Synthesis 844
● 1,4-Phosphastannin

- 1,4-Dihydro-1,4-phosphastannins
- Ring Synthesis 844
● Phosphine Imides
- Reactions 435 (4955)
● Phosphine Oxides
- Alkyldiarylphosphine Oxides
- Reactions 215 (4892)
- Heterocyclic Phosphine Oxides
- Synthesis 622
- 1-Mercaptoalkylphosphine Oxides and *S*-Derivatives
- Synthesis and Reactions 215 (4892)
● Phosphines
- Aminodihalophosphines
- Synthesis 580
- Arylphosphines Type $Ar-PH_2$
- Reactions 843
- Bis[1-alkynyl]-phosphines
- Reactions 844
- Triarylphosphines
- Reactions 14, 699
● Phosphinic Acid Amides
- Synthesis 736 (5037) (5038)
● Phosphinic Acid Esters
- Synthesis 620
● Phosphinic Acid Halides
- Reactions 736 (5037) (5038)
● Phosphinous Acid Esters
- Synthesis 621
● Phospholipids
- Synthesis 673
● Phosphonic Acid Dihalides
- Reactions 478
● Phosphonic Acid Esters
- 1-Acyloxy-1-sulfenylalkanephosphonic Esters
- Synthesis 181
- Alkanephosphonic Esters
- Synthesis 179, 621
- 1-Aminoalkanephosphonic Esters
- Synthesis 239, 337
- Reactions 474
- 1-Alkoxycarbonylalkanephosphonic Esters
- Reactions 564
- 1-Amino-1-alkenephosphonic Esters
- Synthesis 337
- 2-Amino-1-alkenephosphonic Esters
- Synthesis 240
- Arenephosphonic Esters
- Synthesis 621
- 1-Cyanoalkanephosphonic Esters
- Reactions 566
- 1,1-Dihaloalkanephosphonic Esters
- Synthesis and Reactions 616
- 1-Haloalkanephosphonic Esters
- Synthesis and Reactions 616
- 4-Haloalkanephosphonic Esters
- Reactions 27
- Heterocyclic Phosphonic Esters
- Synthesis 622, 862
- Reactions 861
- 1-Hydrazinoalkanephosphonic Esters
- Synthesis 179
- 2-Oxoalkanephosphonic Esters
- Synthesis 240
- 1-Sulfinylalkanephosphonic Esters
- Reactions 181
- Trihalomethanephosphonic Esters
- Reactions 616
● Phosphonic Acids
- 1-Aminoalkanephosphonic Acids
- Synthesis 239, 571, 625, 884
● Phosphonium Salts
- Alkoxytriaminophosphonium Salts
- Synthesis and Reactions 897 (5065)
- Alkyltriarylphosphonium Salts
- Reactions 504 (4965), 681
- Aminophosphonium Salts
- Synthesis 14
- Bis-phosphonium Salts
- Reactions 410
- 1,1-Dihaloalkylphosphonium Salts
- Synthesis 699
- 1-Haloalkylphosphonium Salts
- Synthesis 699
- Hydrogentriarylphosphonium Salts
- Reactions 628
- 1-Iminoalkylphosphonium Salts
- Synthesis and Reactions 552
- 1- and 3-Mercapto-2-alkenylphosphonium Salts and *S*-Derivatives
- Synthesis 628
- Trihalomethylphosphonium Salts
- Synthesis 699
● Phosphonous Acid Esters
- Synthesis 621
● Phosphonous Acid Halides
- Synthesis 450
● Phosphoranes
- 1-Alkoxycarbonylalkylidenephosphoranes
- Reactions 464, 564, 626, 813 (5052)
- Alkylidenephosphoranes
- Reactions 126, 627
- Bis-alkylidenephosphoranes
- Reactions 128, 269
- 1-Cyanoalkylidenephosphoranes
- Reactions 566, 626
- 2-Iminoalkylidenephosphoranes
- Synthesis and Reactions 627
- 2-Oxoalkylidenephosphoranes
- Reactions 519, 626
● Phosphoric Acid Esters

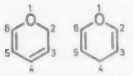
- Alkyl Diaryl Phosphates
- Synthesis 618, 620
- Alkyl Dihydrogen Phosphates
- Synthesis 624, 738
- Reactions 743
- Aryl Dialkyl Phosphates
- Synthesis 618, 620, 752
- Dialkyl Hydrogen Phosphates
- Synthesis 743
- Trialkyl Phosphates
- Synthesis 620, 673
- **Phosphorin**

- 1,4-Dihydrophosphorins
- Ring Synthesis 843
- **Phosphoroamidic Acid Dihalides**
- Synthesis 580
- **Phosphoroamidic Acid Esters**
- Synthesis 618, 620
- Reactions 618
- **Phosphorobromidic Acid Esters**
- Reactions 623
- **Phosphorochloridic Acid Esters**
- Reactions 748
- **Phosphorodiamidic Acid Esters**
- Synthesis 620
- **Phosphorodichloridic Acid Esters**
- Reactions 749
- **Phosphorothioic Acid Esters**
- *S*-Alkyl *O,O*-Disilyl Esters
- Synthesis 683
- *O,O,O*-Triesters
- Synthesis 621
- **Phosphorous Acid Esters**
- Synthesis 621
- Reactions 211 (4880)
- **Phosphorous Acid Triamides**
- Reactions 809 (5041), 897 (5065)
- **Phosphorylsulfenyl Halides**
- Synthesis and Reactions 683
- **Polyalcohols**
- Reactions 484
- **Polyalkali-metal Compounds**
- Reactions 509
- **Polyketones**
- Synthesis 510
- Reactions 513
- **Polynitriles**
- Tetracyanoethylene
- Reactions 886, 895
- **Prostaglandin Precursors**
- Synthesis 575
- **Prostaglandins and Relatives**
- Synthesis 162
- **Purine**



7*H*- 9*H*-

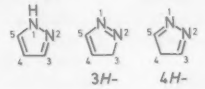
- 7*H*-Purines
- Ring Synthesis 89
- 9*H*-Purines
- Ring Synthesis 89
- 1,2,3,6-Tetrahydro-7*H*-purines
- Ring Synthesis 264
- **Pyran**



2*H*- 4*H*-

- 2*H*-Pyrans
- Ring Synthesis 473
- **Pyrylium Salts**
- Ring Transformation 216 (4893) (4895), 634
- 3,4-Dihydro-2*H*-pyrans
- Reactions with Retention of the Ring Skeleton 578
- 5,6-Dihydro-2*H*-pyrans
- Ring Synthesis 669
- Tetrahydropyrans
- Ring Synthesis 666
- **Pyrazine**

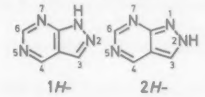
- Pyrazines
- from Like Ring Skeletons 545
- 1,4-Dihydropyrazines
- Ring Synthesis 137
- **Pyrazole**



3*H*- 4*H*-

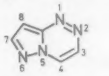
- Pyrazoles
- Ring Synthesis 197, 485, 539
- 2,3-Dihydropyrazoles
- Ring Synthesis 136
- 4,5-Dihydropyrazoles
- Ring Synthesis 539
- **Pyrazolo[1,5-*a*]pyridine**

- Ring Synthesis 7
- **Pyrazolo[3,4-*d*]pyrimidine**

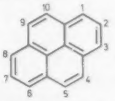


1*H*- 2*H*-

- 4,5,6,7-Tetrahydro-2*H*-pyrazolo[3,4-*d*]pyrimidines
- Ring Synthesis 176
- **Pyrazolo[1,5-*c*][1,2,4]triazine**

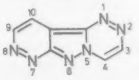


- Ring Synthesis 556
- **Pyrene**



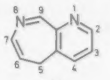
- 4,5,9,10-Tetrahydropyrenes
- Ring Synthesis 236
- **Pyridazine**

- Anellation Reactions 762
- **Pyridazino[3′,4′:3,4]pyrazolo[5,1-*c*][1,2,4]triazine**



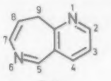
- Ring Synthesis 556
- **Pyridine**

- Pyridines
- from Like Ring Skeletons 545, 634
- Ring Synthesis 326
- Anellation Reactions 89
- Reactions with Retention of the Ring Skeleton 5
- **Pyridinium Salts**
- from Like Carbon Skeletons 885
- Ring Synthesis 634
- Reactions with Retention of the Ring Skeleton 216 (4893)
- *N*-Aminopyridinium Salts
- from Like Ring Skeletons 5
- Reactions 216 (4895)
- **Pyridinium Ylides**
- Synthesis 243
- *N*-Aminopyridinium Ylides
- Synthesis and Reactions 216 (4895)
- 1,2-Dihydropyridines
- Ring Synthesis 50, 841
- Reactions with Retention of the Ring Skeleton 885
- 1,4-Dihydropyridines
- Ring Synthesis 515
- 1,2,3,4-Tetrahydropyridines
- from Like Ring Skeletons 686
- Ring Synthesis 472, 516
- 1,2,3,6-Tetrahydropyridines
- Anellation Reactions 668
- **Piperidines**
- from Like Ring Skeletons 620, 686
- Ring Synthesis 354 (4939), 660 (5012)
- Reactions with Retention of the Ring Skeleton 312
- **Pyrido[2,3-*c*]azepine**



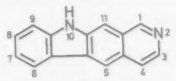
5*H*-

- Ring Synthesis 757
- **Pyrido[3,2-*c*]azepine**



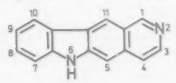
9*H*-

- Ring Synthesis 757
- **Pyrido[3,4-*b*]carbazole**



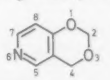
10*H*-

- Ring Synthesis 443
- **Pyrido[4,3-*b*]carbazole**

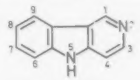


6*H*-

- Ring Synthesis 437
- **Pyrido[4,3-*d*][1,3]dioxin**

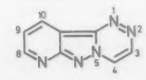


- Hexahydropyrido[4,3-*d*]dioxins
- Ring Synthesis 668
- **Pyrido[4,3-*b*]indole**



5*H*-

- 1,2,3,4-Tetrahydro-5*H*-pyrido[4,3-*b*]indoles
- Ring Synthesis 646
- **Pyrido[2′,3′:3,4]pyrazolo[5,1-*c*][1,2,4]triazine**

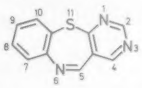


- Ring Synthesis 556

● **Pyrimidine**

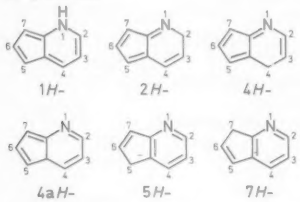
- **Pyrimidines**
- from Like Ring Skeletons 545
- Anellation Reactions 89
- Ring Transformation 459
- **1,2,3,4-Tetrahydropyrimidines**
- Ring Synthesis 756
- Anellation Reactions 176, 177
- **2,3,4,5-Tetrahydropyrimidines**
- Ring Synthesis 647

● **Pyrimido[4,5-*b*][1,5]benzothiazepine**



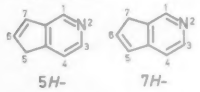
- **1,2,3,4,5,6-Hexahydro[4,5-*b*][1,5]benzothiazepines**
- Ring Synthesis 177

● **1-Pyridine**



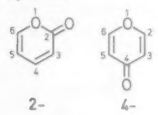
- **6,7-Dihydro-5*H*-1-pyrindines**
- Ring Synthesis 327

● **2-Pyridine**



- **6,7-Dihydro-5*H*-2-pyrindines**
- Ring Synthesis 327

● **Pyrones**

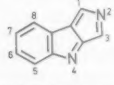


- **2-Pyrones**
- Ring Synthesis 252
- **4-Pyrones**
- Ring Synthesis 515

● **Pyrrole**

- **Pyrroles**
- Ring Synthesis 15, 133, 280, 602
- **1,1′-Bipyrroles**
- Synthesis 414
- **3,4-Dihydro-2*H*-pyrroles**
- from Like Ring Skeletons 498
- **Pyrrolidines**
- from Like Ring Skeletons 498

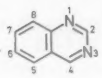
● **Pyrrolo[3,4-*b*]indole**



- **1,2,3,4-Tetrahydropyrrolo[3,4-*b*]indoles**
- Ring Synthesis 646

● **Quaterphenyls**
- Synthesis 897 (5066)

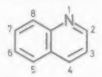
● **Quinazoline**



- **Quinazolines**
- Ring Synthesis 309, 345
- **3,4-Dihydroquinazolines**
- Ring Synthesis 180

● **Quinol Derivatives**
- **Quinol Imines**
- Synthesis and Reactions 708

● **Quinoline**



- **Quinolines**
- from Like Ring Skeletons 117, 865
- Ring Synthesis 500, 723, 815 (5060), 891
- Reactions with Retention of the Ring Skeleton 736 (5036)
- **1,2-Dihydroquinolines**
- from Like Ring Skeletons 497
- Anellation Reactions 768
- **3,4-Dihydroquinolines**
- Ring Synthesis 56
- **5,6,7,8-Tetrahydroquinolines**
- Ring Synthesis 327

● **Quinone Derivatives**

see also: Imines
- **Quinone Bis-acetals**
- Synthesis and Reactions 899 (5072)

● **Quinone Methides**
- Synthesis 713

● **Quinones**
- from Like Ring Skeletons 231, 330
- ***o*-Benzoquinones**
- from Like Ring Skeletons 270, 899 (5071)
- ***p*-Benzoquinones**
- from Like Ring Skeletons 53, 847, 899 (5072)
- Reactions with Retention of the Ring Skeleton 609, 710
- **Diphenoquinones**
- Synthesis 847
- **Naphthoquinones**
- from Like Ring Skeletons 644
- **Phenanthrenequinones**
- Reactions 266

● **1,2,3-Selenadiazole**

- Ring Cleavage 330
- Ring Transformation 764

● **Selenenic Acid Halides**
- Reactions 875

● **Selenium Diimides**
- Synthesis 285 (4903)

● **Selenocarboxylic Acid Amides**
- Synthesis 328, 888

● **Selenocyanates**
- Synthesis 640

● **Selenoethers**
- **1-Alkenyl Selenides**
- Synthesis 902 (5078)
- **Alkyl Aryl Selenides**
- Synthesis 213 (4884), 796, 875
- Reactions 213 (4884), 586 (4985)
- **α-Alkylseleno- and α-Arylselenocarbonyl Compounds**
- Synthesis 211 (4879), 427
- Reactions 211 (4879), 212 (4881)
- **2-Alkynyl Selenides**
- Reactions 902 (5078)
- **Dialkyl Selenides**
- Synthesis and Reactions 213 (4884)
- **Diaryl Selenides**
- Synthesis 796
- **2-Hydroxyalkyl Selenides and *O*-Derivatives**
- Synthesis and Reactions 348 (4918)

● **Selenolo[2,3-*b*]quinoline**

- **2,3-Dihydroselenolo[2,3-*b*]quinolines**
- Ring Synthesis 117

● **Selenols**
- **1-Alkyneselenols**
- Reactions 765

● **Selenonium Salts**
- Synthesis and Reactions 796

● **Selenophene**

- Ring Synthesis 765

● **Selenoxides**
- Reactions 796

● **Semiacetals and Derivatives**
- ***S*-Semiacetal Halides**
- Synthesis 140 (4856)

● **Semiaminals and Derivatives**
- ***N*-Aminosemiaminals**
- Synthesis and Reactions 718

● **Serratanes**
- Reactions 653

● **Silanes**
- **1-Alkenylsilanes**
- Synthesis 27, 812 (5048)
- Reactions 469, 721
- **2-Alkenylsilanes**
- Reactions 469
- **1-Alkynylsilanes**
- Reactions 469
- **Aryldialkylsilanes Type ArR_2SiH**
- Reactions 93
- **Arylsilanes Type $Ar-SiH_3$**
- Reactions 93
- **Bis[1-alkynyl]-silanes**
- Reactions 844
- **Dialkylsilanes Type R_2SiH_2**
- Reactions 93
- **Di- and Polysilyl Compounds**
- Synthesis 28, 29
- ***gem*-Disilyl Compounds**
- Synthesis 867
- **α-Silylcarboxylic Acid Derivatives**
- Synthesis 352 (4933), 867
- **α-Silylnitriles**
- Synthesis and Reactions 636
- **Tetraalkylsilanes**
- Reactions 677
- **Trialkylsilanes Type R_3SiH**
- Reactions 92
- **Trialkylsilanes Type R_3SiX**
- Reactions 92

● **1,4-Silastannin**

- **1,4-Dihydro-1,4-silastannins**
- Ring Synthesis 844

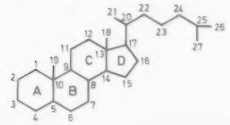
● **Silete**

- **Siletanes**
- Ring Synthesis 29

● **Silyl Esters**
- **Silyl Carboxylates**
- Synthesis 658 (5002), 867
- Reactions 94, 658 (5002)
- **Silyl Phosphites**
- Reactions 683
- **Silyl Phosphorothioates**

- Synthesis 683
- Silyl Sulfenates
- Synthesis 886
● Silyl Ethers
- 1,3-Alkadienyl Silyl Ethers
- Synthesis and Reactions 356 (4944)
- 1-Alkenyl Silyl Ethers
- Synthesis 91, 867
- Reactions 96, 214 (4887), 422, 435 (4954), 700, 732 (5025) (5026), 875, 900 (5074)
- Alkyl Silyl Ethers
- Synthesis 436 (4958)
- Reactions 659 (5008)
- Aryl Silyl Ethers
- Synthesis 436 (4958)
- Dienediol Silyl Ethers
- Synthesis 432
- Enediol Silyl Ethers
- Reactions 142 (4863)
- 2-Halo-1-alkenyl Silyl Ethers
- Synthesis 422
- 3-Oxo-1-alkenyl Silyl Ethers
- Reactions 432
- 3-Oxo-1-alken-2-yl Silyl Ethers
- Reactions 432
● Spiro Compounds
- Carbocyclic Spiro Compounds
- Synthesis 26, 291, 349 (4922)
- Heterocyclic Spiro Compounds
- Synthesis 29, 76, 77, 78, 81, 82, 89, 112, 153, 191, 201, 806
● Stannanes
- Stannanes Type R_2SnH_2
- Reactions 844
- Stannanes Type R_2SnX_2
- Reactions 507 (4975)
- Stannanes Type R_3SnX
- Reactions 311
- α-Stannylcarboxylic Acid Derivatives
- Synthesis 311
● Squaric Acid and Derivatives
- Reactions 845
● Stannin

- 1,4-Dihydrostannins
- Ring Synthesis 844
● Steroids and Relatives



- *vic*-Acylaminohydroxysteroids
- Synthesis 35
- Cholestenes
- Reactions 355 (4941)
- *vic*-Dihydroxysteroids and *O*-Derivatives
- Synthesis 168, 355 (4941)
- Diketosteroids
- Reactions 466
- Epoxysteroids
- Reactions 35
- 6-Halomethylsteroids
- Synthesis 36
- Heterocycle-Fused Steroids
- Synthesis 322
- D-Homo-lactones
- Synthesis 427
- Hydroxysteroids, General
- Reactions 504 (4963) (4965), 505 (4966), 673
- Ketosteroids, General
- Reactions 773
- 17-Oxosteroids
- Synthesis 351 (4928)
- Reactions 427
- $\Delta^{5,6}$-Steroids
- Reactions 36
● Stilbenes
- Synthesis 58
● Sulfamic Acids
- Synthesis and Reactions 735 (5034)
● Sulfamic Halides
- Synthesis 40, 735 (5034)
- Reactions 40
● Sulfenic Acid Amides
- Synthesis 14, 799, 814 (5057)
- Reactions 810 (5044), 814 (5057)
● Sulfenic Acid Halides
- Synthesis 814 (5057)
- Reactions 436 (4957), 799, 814 (5057)
● Sulfilimines
- Synthesis 650
- Reactions 650, 694
● Sulfinic Acid Amides
- Reactions 531
● Sulfinic Acids
- Synthesis 794
- Reactions 260, 794
● *N*-Sulfinyl Compounds
- Reactions 275, 305
● Sulfones
- Synthesis and Reactions 534
- 1-Alkenyl Sulfones
- Synthesis 312, 470
- 2-Alkenyl Sulfones
- Synthesis 469
- Alkyl Aryl Sulfones
- Synthesis 588 (4989)
- Reactions 348 (4919)
- 1-Aminoalkyl Sulfones
- Synthesis and Reactions 794
- 1-Cyanoalkyl Sulfones
- Synthesis 690
- Cyclic Sulfones
- Synthesis 201
- Diaryl Sulfones and Hetero Analogs
- Synthesis 588 (4989)
- 1,2-Epoxyalkyl Sulfones
- Synthesis and Reactions 503 (4960)
- Dialkyl Sulfones
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- 1-Haloalkyl Sulfones
- Reactions 503 (4960)
- 2-Haloalkyl Sulfones
- Reactions 469
- 2-Oxoalkyl Sulfones
- Synthesis 99
● Sulfonic Acid Amides
- Alkanesulfonamides
- Reactions 532
- Arenesulfonamides
- Synthesis 14, 40, 144 (4871), 305
- Reactions 532
- Trihalomethanesulfonamides
- Synthesis 798
● Sulfonic Acid Azides
- Reactions 101
● Sulfonic Acid Esters
- 1-Alkenyl Sulfonates
- Synthesis 97
- Alkyl Sulfonates
- Reactions 461, 727 (5013)
- Arenesulfonic Esters
- Reactions 285 (4902), 588 (4989)
● Sulfonic Acid Halides
- Reactions 469
● Sulfonic Acids
- Synthesis 461
● Sulfonium Salts
- Alkylthiosulfonium Salts
- Synthesis 144 (4872)
- Aminosulfonium Salts
- Synthesis 11
- α-Sulfoniocarboxylic Acid Derivatives
- Synthesis 347 (4916)
● Sulfonothioic Acid Esters
- *S*-Esters
- Synthesis 14
● Sulfonyl Cyanides
- Reactions 784
● Sulfoxides
- Synthesis 534
- Reactions 404, 468, 534, 583, 792
- 1-Alkenyl Sulfoxides
- Reactions 299
- Alkyl Aryl Sulfoxides
- Synthesis 299, 789
- Reactions 72 (4851), 299
- Diaryl Sulfoxides
- Synthesis 789
- 1-Haloalkyl Sulfoxides
- Synthesis 791, 809 (5039)
- Reactions 789, 809 (5039)
- α-Sulfinylcarboxylic Acid Derivatives
- Synthesis and Reactions 657 (5000)
- Sulfinylphosphonic Acid Derivatives
- Reactions 181
● Sulfoximines
- Synthesis 12, 650
- Reactions 650
● Sulfoximinium Salts
- Synthesis 650
● Sulfuranes
- Reactions 520

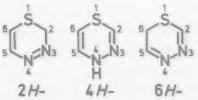
● Terpenes
- Monoterpenes
- Synthesis 307, 334
- Reactions 212 (4883), 670, 904 (5084)
- Sesquiterpenes
- Synthesis 156, 160
- Triterpenes
- Reactions 653
● 1,4,7,10-Tetraazatetracyclo-[5.5.1.$0^{4,13}$.$0^{10,13}$]tridecanes

- Ring Synthesis 83
● Tetracyano Compounds
see: Polynitriles
● Tetracyclo[2.2.1.$0^{2,6}$.$0^{3,5}$]heptanes (Quadricyclanes)

- Ring Transformation 158
● Tetracyclo[4.3.0.$0^{2,9}$.$0^{3,7}$]nonanes

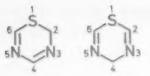
- Ring Synthesis 292
● Tetrahetero-Substituted Ethylenes
- Type
- Synthesis 96
● 4-Thia-1-azabicyclo[3.2.0]heptane

- Ring Cleavage 494
● 1,3,4-Thiadiazine



2*H*- 4*H*- 6*H*-

- Ring Transformation 197, 485
● 1,3,5-Thiadiazine



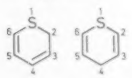
2*H*- 4*H*-

- Ring Synthesis 476
● 1,2,3-Thiadiazole

- Ring Cleavage 330
● 1,2,5-Thiadiazole

- Tetrahydro-1,2,5-thiadiazoles
- from Like Ring Skeletons 63
- Ring Synthesis 64
● 1,3,4-Thiadiazole

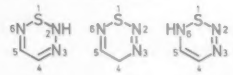
- 2,5-Dihydro-1,3,4-thiadiazoles
- from Like Ring Skeletons 201
- Ring Transformation 201
- Tetrahydro-1,3,4-thiadiazoles
- Ring Synthesis 201
● Thiapyran



2*H*- 4*H*-

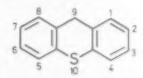
- 3,4-Dihydro-2*H*-thiapyrans
- Ring Synthesis 472
● 1,3-Thiaselenole

- Ring Synthesis 764
● 1,2,3,6-Thiatriazine

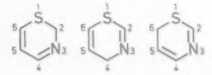


2*H*- 4*H*- 6*H*-

- Ring Synthesis and Cleavage 305
● Thiaxanthene



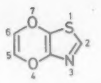
- Thiaxanthylium Salts
- Reactions with Retention of the Ring Skeleton 862
● 1,3-Thiazine



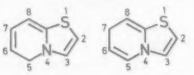
2*H*- 4*H*- 6*H*-

- Tetrahydro-1,3-thiazines
- Ring Synthesis 881
● 1,3-Thiazole

- 1,3-Thiazoles
- Ring Synthesis 501
- Anellation Reactions 320
- 4,5-Dihydro-1,3-thiazoles
- Ring Synthesis and Cleavage 191
- Tetrahydro-1,3-thiazoles
- Ring Synthesis 90, 133, 322, 881
● 1,3-Thiazolo[1,4]dioxin

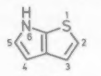


- 3a,5,6,7a-Tetrahydro-1,3-thiazolo[1,4]dioxins
- Ring Synthesis 320
● [1,3]Thiazolo[3,2-*a*]pyridine



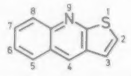
5*H*- 7*H*-

- 2,3-Dihydro-7*H*-[1,3]thiazolo[3,2-*a*]pyridines
- Ring Synthesis and Cleavage 839
● Thieno[2,3-*b*]pyrrole



6*H*-

- Ring Synthesis 487
● Thieno[2,3-*b*]quinoline



- Thieno[2,3-*b*]quinolines
- from Like Ring Skeletons 612
- 2,3-Dihydrothieno[2,3-*b*]quinolines
- Ring Synthesis 612
● Thiete

- Thietanes
- from Like Ring Skeletons 201
● Thiirene

- Thiiranes
- Ring Synthesis 201
● Thiocarbamic Acid Esters (Carbamothioic Acid Esters)
- *O*-Esters
- Synthesis and Cyclization Reactions 191
- *S*-Esters
- Cyclization Reactions 191
● Thiocarbonic Acid Esters
- *O,S*-Diesters
- Reactions 659 (5006)
● Thiocarboxylic Acid Amides
- Synthesis 328, 386
- Cyclization Reactions 193, 476
- Reactions without Cyclization 250, 902 (5080)
- Alkanethioamides
- Synthesis 888
- 3-Alkenethioamides
- Synthesis 600
- *N*-(1-Alkoxyalkyl)-thiocarboxamides
- Synthesis 250
- 2-Aminoalkanethioamides
- Cyclization Reactions 478
- 2-Hydroxyalkanethioamides
- Synthesis 386
- 3-Oxo-4-alkenethioamides
- Synthesis 472
● Thiocarboxylic Acid Esters
- *S*-Esters
- Synthesis 353 (4935), 587 (4988)
- Reactions 247
● Thiocarboxylic Acids
- Mercaptoalkanethioic Acids
- Reactions 881
● Thiocyanates
- Alkyl Thiocyanates
- Synthesis 185, 504 (4965)
- 2-Haloalkyl Thiocyanates
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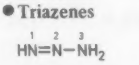

- Synthesis and Reactions 691
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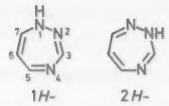

1*H*- 2*H*-

- 3,4,5,6-Tetrahydro-2*H*-1,2,4-triazepines
- Ring Synthesis 756
- 1,3,5-Triazine

- Hexahydro-1,3,5-triazines
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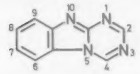
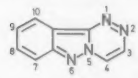
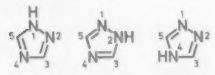
- [1,3,5]Triazino[1,2-*a*]benzimidazole



- 1,2,3,4-Tetrahydro[1,3,5]triazino[1,2-*a*]-benzimidazoles
- Ring Synthesis 806
- [1,2,4]Triazino[4,3-*b*]indazole



- Ring Synthesis 557
- 1,2,4-Triazole



2*H*- 4*H*-

- 1,2,4-Triazolium Salts
- Ring Synthesis 733 (5029)
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- from Like Ring Skeletons 733 (5029)
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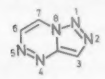
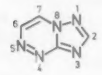
- [1,2,3]Triazolo[4,3-*c*][1,2,4]triazine



- Ring Synthesis 556
- [1,2,4]Triazolo[3,2-*c*][1,2,4]triazine



- Ring Synthesis 556
- Tricarboxylic Acid Esters
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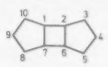
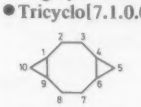
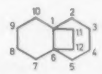
- Tricyclo[4.2.2.0^{2,5}]deca-3,7-dienes
- Ring Synthesis 292
- Tricyclo[5.3.0.0^{2,6}]decane



- Ring Synthesis 47, 156
- Tricyclo[7.1.0.0^{4,6}]decane



- Ring Synthesis 783
- Tricyclo[4.4.2.0^{1,6}]dodecane



- Tricyclo[4.4.2.0^{1,6}]dodeca-2,4,7,9-tetraenes
- from Like Ring Skeletons 280
- Tricyclo[4.4.2.0^{1,6}]dodeca-2,4,8,11-tetra-enes
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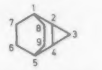
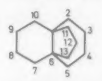
- Tricyclo[3.2.2.0^{2,4}]nonane



- Tricyclo[3.2.2.0^{2,4}]non-6-enes
- Ring Synthesis 292
- Tricyclo[4.4.3.0^{1,6}]tridecane



- Tricyclo[4.4.3.0^{1,6}]trideca-2,4,7,9-tetra-enes
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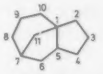
- Tricyclo[5.2.2.0^{1,5}]undec-5-enes
- Ring Synthesis 581
- Tricyclo[6.2.1.0^{1,5}]undecane



- Tricyclo[6.2.1.0^{1,5}]undec-4-enes
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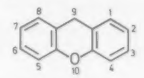

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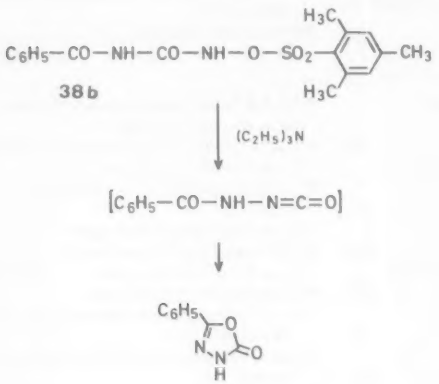
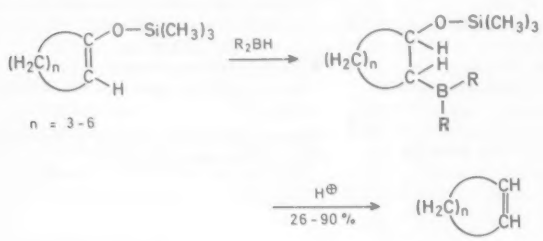
Errata 1977

Y. Tamura, J. Minamikawa, M. Ikeda, *Synthesis* **1977**, 1–17.
Formula scheme on page 16, right-hand column should be:



J. K. Rasmussen, *Synthesis* **1977**, 91–111.
The 1st formula scheme on page 106, left-hand column should be:



G. Cahiez, D. Bernard, J. F. Normant, *Synthesis* **1977**, 130–133.
The boiling point for the 18th compound in Table 1 ($R^1 = n\text{-}C_4H_9$, $R^2 = C_6H_5$) should be 136°/13 torr.

Abstract no. 4860, *Synthesis* **1977**, 141.
The title should be:
Dehydrogenation of Open-Chain and Cyclic Diketones by Palladium-(II) Compounds

S. M. Ali, T. V. Lee, S. M. Roberts, *Synthesis* **1977**, 155–166.
The correct name for compound **85** (page 164, left-hand column) is:
cis-4-carboxymethyl-2,2-dimethylcyclobutanecarboxylic acid.

B. Unterhalt, H. Koehler, *Synthesis* **1977**, 265–266.
The name for compounds **4** should be:
3-(dialkylaminomethoximino)-1-phenylbutene or 1-phenylbutenon-*O*-(dialkylaminomethyl)-oxime.

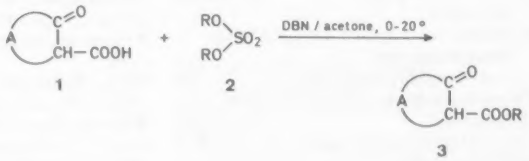
R. C. Brown, H. Cairns, J. L. Suschitzky, *Synthesis* **1977**, 276–277.
The name for compounds **9** and **4a** (page 277, right-hand column) should be: 6-carboxy-9-hydroxy-8-oxo-10-propyl-1,2,3,8-tetrahydroindazolo [4,3a,3,2-*hij*]quinoline and 2-carboxy-1-ethyl-5-hydroxy - 4 - oxo - 6 - propyl - 1,4,7,8,9,10 - hexahydrobenzo[*h*]-quinoline, respectively.

Abstract No. 4924, *Synthesis* **1977**, 350.
The title should be:
Selective Cleavage of Aryl Esters by Potassium or Cesium Carbonate

Abstract No. 4937, *Synthesis* **1977**, 354.
The title should be:
3-Alkanolides by Cycloaddition of Lithium Alkynoxides with Carbonyl Compounds

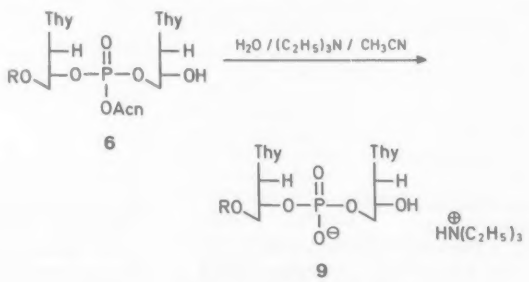
W. Flitsch, W. Schulten, *Synthesis* **1977**, 414–415.
The name for compound **5** should be:
4,9-Dichloro-3,8-dihydro-10b,10c-diazadicyclopenta[*ef*,*kl*]-heptalen.

Abstract No. 4951, *Synthesis* **1977**, 434.
The formula scheme should be:



Abstract No. 4958, *Synthesis* **1977**, 436.
The title (and name of reagent **2**) should be:
Trimethylsilyl Trimethylsilylamidosulfate; A new Silylating Reagent

F. Ramirez, E. Evangelidou-Tsolis, A. Jankowski, J. F. Marecek, *Synthesis* **1977**, 451–453.
The formula Scheme **B** should be:



Abstract No. 4976, *Synthesis* **1977**, 508.
The title (and name of reagent **1**) should be:
2-Alkenenitriles from Ethyl 2-Cyanoalkanoates.

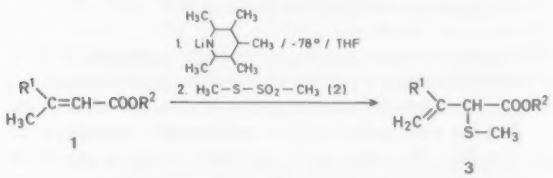
S. A. DiBiase, G. W. Gokel, *Synthesis* **1977**, 629–632.
The heading for the last experimental procedure (page 631, right-hand column) should be:
Preparation of Decahydronaphthalen-2-ylidenacetonitrile.
Acknowledgement should be added:
We thank the donors of the Petroleum Research Fund, administered by the American Chemical Society, for support of this work.

R. J. K. Taylor, *Synthesis* **1977**, 564–565.
Table 2 should be as follows:

Table 2. Reactions of α,β-Unsaturated Ketones **4** and **5** with Diethyl α-Ethoxycarbonyl-α-sodiomethanephosphonate

Substrate	Reaction Conditions solvent/temp./time	Product	Yield [%]	m.p.[a]	Molecular formula[b]	^{1}H-N.M.R. ($CDCl_3$, 60 MHz) δ [ppm] (vinylic protons)
4	C_6H_6/r.t./1 h	**2c**	6	see Table 1		
		3c	46			
5	C_6H_6/r.t./0.5 h	**2d**	11	oil	$C_{14}H_{20}O_4$ (252.3)	5.67 (m, 2H)[c]
		3d	43	33–35°	$C_{14}H_{20}O_4$ (252.3)	5.87 (s, 2H)

Abstract No. 5000, *Synthesis* **1977**, 657.
The formula scheme for the conversion **1**→**3** should be:



J. T. Wróbel, J. Cybulski, Z. Dabrowski, *Synthesis* **1977** (10), 686–688.

The second paragraph (p. 686) should begin:
2-Methylglutarimide (**1a**)[2] and the *N*-benzyl derivative (**1b**) react readily with phenyllithium (**2d**) and 3-furyllithium (**2c**)[3]...

In footnoote of the Table (p. 687) the maximum deviations should be:
C ±0.32%, H ±0.12%, N ±0.21%.

In the second experimental procedure (p. 687) the first line should be:
A solution of 3-furyllithium[3] (**2c**; 0.01 mol) or phenyllithium (**2d**;

K. Yamamoto, O. Nunokawa, J. Tsuji, *Synthesis* **1977**, 721–722.
The heading for the last experimental procedure (p. 721, right-hand column) should be:
(*E*)-2-Octenal; Typical Procedure for the Preparation of 2-Alkenals.

SYNTHESIS International Journal of Methods in Synthetic Organic Chemistry 1977

Authors' Guidelines

I. Review Articles

Potential authors are asked to contact Prof. G. Schill or Prof. G. Sosnovsky before submitting a manuscript in order to avoid disappointment or exceptionally long delays in publication.

The subject matter which might be acceptable is almost unlimited provided that the emphasis is on practical methods in synthetic organic chemistry. The article should give either a complete description of the methods which have not been previously reviewed or a critical evaluation of new developments to known methods. The manuscript should be written in the style currently used in SYNTHESIS and should include as many up-to-date, key references as possible. Language of publication is English or German.

In addition to the suggestions given in Section III, the following points should be followed during the preparation of manuscripts for review articles:

1. The manuscript should not exceed 40 pages (DIN A4 or Quarto), including references, formulae, and tables, typed with double spacing (~15–20 printed pages). Longer articles may be accepted under exceptional circumstances; however, publication of such articles may be delayed until sufficient space is available.
2. The methods described must be illustrated by detailed descriptions of the experimental procedures involved. These should preferably be unpublished or be selected from less common sources. A critical evaluation of the methods should be given whenever possible.
3. Discussion of theory and mechanism should be limited to the minimum necessary for a clear understanding of the reactions under consideration. Historical background should be avoided or restricted to a minimum.
4. Clear reaction schemes (not only individual structures) should be given and tabulation of critically selected analogous results made whenever possible.
5. Each review article must be preceded by a table of contents and a concise abstract reflecting accurately the subject matter.
6. Only in exceptional cases should the author restrict the presentation to his own work.
7. As it is attempted during page-setting to put the reference on the same page as its first appearance in the text, the quotation of authors' names in the text should be avoided.
8. The material contained in previous review articles should be considered and repetitions avoided wherever possible.

It should be pointed out that, during the early stages of its development, SYNTHESIS paid modest fees to authors invited by the Editors to write review articles. Such fees are no longer paid and the savings thus achieved are used to cover the cost of the occassional, necessary increases in the content of SYNTHESIS. Page charges are not made.

II. Original Communications

Manuscripts (3 copies should be submitted) for original communications should not exceed 6 pages (DIN A4 or Quarto) typed double spaced and may be submitted to the editorial office or one of the three editors. Language of publication is English or German.

The style of communications currently published in SYNTHESIS should be followed. Clear reaction schemes (not only individual structures), tabulations of results, and detailed descriptions of the experimental procedures are essential. The scope of the methods described should be illustrated by several examples. A limited discussion of reaction mechanisms should only be included if it contributes to the clarity of the presentation. The suggestions given in Section III should be followed as closely as possible.

Manuscripts dealing with the following topics are invited for submission as communications in SYNTHESIS.

1. *Description of new synthetic methods:* advantages of the new method over the presently existing methods for the same process should be indicated and the scope and limitations of the new method should be indicated by several examples.
2. *Description of significantly improved synthetic methods,* advantages of the new development over currently used methods should be clearly demonstrated by parallel experiments under similar conditions.
3. *New and/or improved preparations of key intermediates, or of new classes of compounds.* Potential applications of the key intermediates should be indicated briefly.

Manuscripts describing syntheses of *new* compounds by *known* methods will not be accepted. Exceptions may be possible in cases of important key intermediates or new classes of compounds. Also manuscripts describing methods which may be described as new but which are, in fact, directly analogous to known methods may not always be accepted.

The Editors reserve the right to reject manuscripts which they consider deal with topics of too specialised interest and which would be more suitably published in an appropriate specialist journal.

Communications which are accepted for publication will be published as rapidly as is technically possible. It is therefore of interest to readers and authors that all manuscripts be concise and in accord with the directions given here.

Manuscripts from authors whose mother language is not English or German will be checked carefully and corrected where necessary by the editorial staff; this may lead to some delay in publication.

III. Preparation of Manuscripts

Language of publication of Reviews and Communications is English or German:

1. Three copies of the manuscript should be submitted. The manuscript should be typed double spaced; indentations and underlinings should be avoided (except for complicated cases, as in sugar chemistry, where the type of script to be used may be indicated by underlining). In the case of manuscripts with more than one author, the author to whom correspondence is to be addressed should be indicated (*).

2. The nomenclature used should be based on the systematic rules adopted by *Chemical Abstracts* (Index Guide Vol. 76), *Ring Index* and *Supplements* (American Chemical Society, 1959–1965), IUPAC (*Nomenclature of Organic Chemistry*, Parts A, B & C, Butterworths, London, 1969) etc. Trivial names should be avoided unless they are definitely advantageous over the corresponding systematic names.

3. Whenever possible, clear formulae (reaction schemes are to be preferred to individual structures) should be given for the reaction described. Freehand drawings of organic structures are acceptable. However, it is emphasised that the presentation should be clearly and neatly carried out.

   Note: for iodine, the sign J is used, not I (for reasons of clarity, as the capital I is identical with the Roman numeral I and in some types of script also with the small letter l and the numeral 1).

4. In the presentation of tables, the form of the tables already published in SYNTHESIS should be followed.

5. Experimental procedures should be concise but contain all essential data referring to performance of the reaction and isolation of products. For all compounds prepared, yields of isolated product should be given (amount and percentage based on starting material). Manuscripts in which yields are not given or in which yields are estimated only by G.L.C. or by spectral methods may not be accepted. When the preparation of a series of similar (e.g. homologous) compounds is described, a general procedure should be given and the data for the individual compounds presented in tabular form.

Example:

4-Oxo-4,5-dihydrofuro[2,3-c]quinoline:
A solution of furan-2-carboxanilide (200 mg, 1.07 mmol) in a mixture of benzene (180 ml) and ethanol (20 ml) is irradiated with a 100 Watt high-pressure mercury lamp at room temperature for 10 h. The solvent is removed in vacuo and the residue separated by preparative T.L.C. on silica gel using benzene/ethyl acetate (4:1) as eluent; yield: 50 mg (25 %); m.p. 282.5 – 283° (from ethanol).

$C_{11}H_7NO_2$ (185.2) calc. C 71.35 H 3.81 N 7.56
found 71.16 3.88 7.49

M.S.: m/e (relative intensity) = 185 ($M^{\oplus}$, 65), 156 (34), 129 (100), 102 (78).

I.R. (Nujol): ν_{max} = 3150, 1680 cm^{-1}.

U.V. (ethanol): λ_{max} = 218 (ε = 67 000), 258 (8 900), 308 (9 100), 320 nm (7 300).

^{1}H-N.M.R. (DMSO-d_6): δ = 8.10 (s, 1H), 7.94 (d, 1H, J = 7 Hz), 7.50 (s, 2H), 7.33 ppm (s, 2H).

Further example for the presentation of N.M.R. data:

^{1}H-N.M.R. ($CDCl_3$): δ = 8.2 (s, 1H, -N=C<u>H</u>-), 6.9 (s, $1H_{arom}$), 6.61 (s, $1H_{arom}$), 3.89 (m, 4H, $-C\underline{H}_2-CH_3$), 3.49 (d, 6H, $-OCH_3$, J = 3 Hz), 0.81 ppm (m, 6H, $CH-C\underline{H}_3$).

For new compounds (which should be clearly indicated as such), sum formulae, molecular weights to 1 decimal place, and elemental analyses (where possible) and characteristic physical and spectral data should be given. In order to save space elemental analysis data in tables may be removed *by the editorial staff* and replaced by a footnote "All compounds gave satisfactory elemental analysis (C ± 0.3%, H ± 0.14%, etc)". I.R. absorptions must be given in wave-numbers ν[cm^{-1}], not in wavelengths, λ; U.V. data in wave lengths λ[nm]; and N.M.R. data in δ values, not τ values. For all spectral data, the solvent used must be given. For known compounds physical data with comparative literature values should be given. Corrected values should be given for all melting and boiling points.

6. In the text, full chemical names should be used instead of formulae whenever possible (e.g. hydrogen chloride or hydrochloric acid, respectively, not HCl). In certain cases, however (e.g. complexes having complicated names) formulae will be accepted.

7. The following abbreviations should be used:

Groups (to be used in formulae):

A	Groups such as $-(CH_2)_n-$, $-C_6H_4-$, and hetero analogs
M	Metal
R	(preferentially) C-Substituents
X	Halogen, OR, NR_2, SR, etc. (monovalent)
Y	O, S, NH, etc. (bivalent)

and the abbreviations used in peptide and sugar chemistry.

Methods

C.D.	Circular dichroism
E.S.R.	Electron-spin resonance spectrum
G.L.C.	Gas-liquid (partition) chromatography
H.P.L.C.	High pressure liquid chromatography
I.R.	Infra-red spectrum
M.S.	Mass spectrum
N.M.R.	Nuclear magnetic resonance spectrum
N.Q.R.	Nuclear quadrupole resonance spectrum
O.R.D.	Optical rotatory dispersion
T.L.C.	Thin-layer chromatography
U.V.	Ultra-violet spectrum

Measures

nm	nanometer
mm	millimeter
cm	centimeter
m	meter
mg	milligram
g	gram
kg	kilogram

ml	milliliter
l	liter
mmol	millimole(s)
mol	mole(s)
equiv	equivalent
sec	second
min	minute
h	hour
torr	torr (mm Hg)
atm	atmosphere (do not use "psi")
°	degree (temperature); note: ° implies °C (C is deleted)

Miscellaneous (to be used in formulae, experimental procedures, footnotes, tables etc.)

b.p.	boiling point
m.p.	melting point
subl.p.	sublimation point
r.t.	room temperature (only in formulae and tables)
Mol. weight	Molecular weight
V	heating (only in formulae)
ϕ	diameter

8. References should be placed collectively at the end of the article or communication. They should be numbered consecutively. Subdivisions such as 3a, 3b should be avoided. It is requested that the references be checked carefully before the manuscript is submitted. In quotations with more than four authors, only the name of the first author is given with the addition "et al.". Journal abbreviations should be in accord with *Chemical Abstracts* practice (see *Bibliographic Guide for Editors and Authors*, American Chemical Society, 1974).

Examples:

[1] G.H.Williams, Homolytic Aromatic Substitution, Pergamon Press, London, 1970, p. 42.

[2] H.Viehe, Z.Janousek, Angew. Chem. 83, 614 (1971); Angew. Chem. Int. Ed. Engl. 10, 573 (1971).

[3] M.Černý, J.Málek, Tetrahedron Lett. 1969, 1739.

[4] M.B.Scott, J. Chem. Soc., Perkin Trans. 1 1972, 1432.

[5] A.M.Knowles et al., J. Chem. Soc. [C] 1971, 598.

[6] N.L.Burde, L.V.Alekseeva, B.N.Lundin, Zh. Obshch. Khim. 38, 439 (1968); J. Gen. Chem. USSR 38, 434 (1968).

[7] F.Eloy, R.Lenaers, C.Moussebois, U.S.-Patent 3 227 725 (1966), Union Carbide Corp.; C.A. 64, 9736 (1966).

9. The use of footnotes referring to the text should be avoided if possible. Footnotes should be numbered consecutively with the references throughout the manuscript. Footnotes may be used for tables and should be designated as a, b, c, etc.

10. Whenever possible, copying of drawings and graphs from other journals or printed matter should be avoided. It is the task of the author to obtain permission for the reproduction of such figures.

11. Acknowledgements may only be made for financial support, essential gifts of chemicals or apparatus, and performance of essential parts of the work (elemental analyses, spectra, etc.) by other firms, institutions, etc. The acknowledgements should be kept as brief as possible and placed at the end of the manuscript. Similarly, dedications should be brief and placed at the end of the manuscript.

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Galley proofs will be sent to the authors for correction. They should be returned as soon as possible to the editorial office. Please note that the signs XXXXX, 00000, ▮▮▮▮▮▮▮, ???????, etc. indicate that something was missing or unintelligeable in the manuscript and the pertinent information should be added during correction.

It is requested that corrections be limited to the elimination of printing errors. Alterations and expansions are to be avoided for reasons of increased costs. The proof sheets are not indicative of the quality of the print. This applies particularly to the lay-out of tables. Due to the particular mode of setting, the corrections of misspellings are expediently carried out at the same time as the author's corrections.

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V. Für Autoren deutscher Arbeiten

Für deutsch-sprachige Arbeiten gelten die vorstehend aufgeführten Richtlinien in gleicher Weise. Die Autoren werden gebeten zu beachten, daß bei den Arbeitsvorschriften die Mengenangaben immer in Klammern hinter die betreffenden Verbindungen gesetzt werden; Angabe der Ausbeute in erhaltener Menge und % der Theorie. Die Anordnung der Analysen-Daten und der spektralen Daten erfolgt ebenfalls wie im obigen englischen Beispiel angegeben. Die Nomenklatur wird weitgehend der *Chemical Abstracts*- und *IUPAC*-Nomenklatur angeglichen; z. B. Chloroalkan, Bromocyclohexan, 4-Cyanopyridin, Alkyn, usw.

Autoren werden auch auf die deutsche Fassung der IUPAC-Regeln [*Internationale Regeln für die chemische Nomenklatur und Terminologie, Deutsche Ausgabe*, H. Grünewald (Hrsg.), Verlag Chemie, Weinheim/Bergstr., 1975] hingewiesen.

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